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ABSTRACT

Issues surrounding costs and financing of education in developing countries are examined. The focus is primarily on Sub-Saharan Africa and within Francophone West Africa. International comparative data are used to evaluate educational cost issues, including total expenditures, expenditures per pupil, cost of teachers, student aid, other current expenditures, and capital expenditures. Particular attention is given to the special situation of African countries, most of which experience severe financial constraints in the effort to achieve educational goals. The potential for increased enrollments through a reduction in unit costs and enhanced efforts to tap private resources for educational financing are explored. The problem of cost recovery in terms of the role and limits of economic analysis and the particulars of educational finance in developing countries are presented. The overall conclusion is that although the financial prospects are bleak in the poorest countries, existing budgets can be used much more efficiently than they are currently. Unit costs can be significantly reduced, and some changes in the pattern of subsides to education may allow for a sizable expansion of education within existing budgets.
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Educational Costing and Financing in Developing Countries

Focus on Sub-Saharan Africa

J. C. Eicher

WORLD BANK STAFF WORKING PAPERS
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Focus on Sub-Saharan Africa

J. C. Eicher

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Abstract

The paper analyzes issues in the costs and financing of education in developing countries. It focuses primarily on Sub-Saharan Africa, and within that on Francophone West Africa. After evaluating the educational cost data used in international comparisons, the paper focuses on the special situation of African countries, most of which experience severe financial constraints in their effort to achieve educational goals. It examines the potential for, first, reducing unit costs as a way of increasing enrollment within an existing budget, and second, tapping private sources of financing for education. The overall conclusion is that although the financial prospects are rather bleak in the poorest countries, existing budgets could be used much more efficiently than at present. Units costs can often be significantly reduced, and some changes in the pattern of subsidies to education may allow for a sizeable expansion of education within existing budgets.

Extracto

En el presente documento se analizan cuestiones relativas a los costos y financiación de la educación en los países en desarrollo. Se ha centrado la atención principalmente en Africa al Sur del Sahara y, dentro de esa región, en la zona de habla francesa de Africa Occidental. Tras evaluar los datos sobre costos de la educación utilizados en comparaciones internacionales, se examina específicamente la situación especial de los países africanos que, en su gran mayoría, experimentan graves limitaciones financieras en sus esfuerzos para lograr los objetivos de la educación. En primer lugar, se analiza el potencial para reducir los costos unitarios como un medio para incrementar la matrícula dentro de los límites de los presupuestos vigentes y, en segundo lugar, para captar fondos privados con destino a la financiación de la educación. La conclusión general es que, aunque las perspectivas financieras son bastante sombrías en los países más pobres, los presupuestos vigentes podrían ser utilizados mucho más eficientemente que en la actualidad. En muchos casos, los costos unitarios podrían reducirse significativamente, y la implantación de algunos cambios en el sistema de subvenciones a la educación podría permitir una expansión considerable de los programas educativos dentro del marco de los mencionados presupuestos.

Le document traite des problèmes que posent le coût et le financement de l'éducation dans les pays en développement. L'analyse est essentiellement axée sur l'Afrique au sud du Sahara et notamment sur les pays francophones de l'Afrique de l'Ouest. Après avoir procédé à un examen critique des statistiques utilisées dans les comparaisons internationales des coûts de l'éducation, l'auteur décrit la situation particulière des pays africains, qui éprouvent presque tous des difficultés à réaliser leurs objectifs d'éducation en raison de sérieuses contraintes financières. Il examine dans quelle mesure il est possible, d'une part, de réduire les coûts unitaires afin d'accroître les effectifs scolarisés sans grever davantage les finances de l'Etat et, d'autre part, de faire appel à des sources privées pour financer l'éducation. L'auteur conclut que, si les perspectives financières sont plutôt sombres dans les pays les plus déshérités, les ressources budgétaires pourraient être utilisées de façon beaucoup plus efficace qu'elles ne le sont à présent. Dans bien des cas, on pourrait réduire sensiblement les coûts unitaires et, en remaniant le régime des subventions à l'éducation, on pourrait sans doute développer le système éducatif de façon notable sans augmenter le budget de ce secteur.

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Summary of the Main Findings and Policy Recommendations

Many governments of developing countries complain education is getting "too costly" and that they can no longer finance the development or sometimes, even the maintenance of their school systems. They ask advice on how to reduce costs and/or to recover part of them by tapping other sources of finance.

Before addressing issues in costing education and in cost recovery, this report looks at the availability and quality of data on the cost of education. Part I shows that the available data are incomplete and unreliable, for the following reasons:

- We have to rely almost exclusively on macrodata taken from government budgets.
- These data give information on expenditures and not on costs.
- The data available generally show planned, not actual, expenditures.
- There is no standard way to define and classify expenditures on education.
- Their coverage changes from one country to the next and sometimes from year to year for the same country.
- Some proportion of public expenditures on education comes from budgets other than that of the Ministry of Education; the data are thus difficult to synthesize.

To remedy this state of affairs:

- Collection of cost data at the local level through local surveys of schools and of households is imperative.
- The work started at UNESCO and in the World Bank to harmonize and standardize data on public expenditures on education should be pursued and intensified.
- At present, international organizations organize courses and seminars in budgeting and planning for officials from ministries of education in developing countries. These courses should be increased and should focus more on cost-related issues.

Most African countries face a dilemma in educational finance: enrollments are low, the school age population is growing fast, and there are tremendous social pressures to expand education; meanwhile, education already uses a large proportion of the public budget, and its expansion has to compete with other pressing demands. Part II of the report discusses the reduction of unit costs as a way of increasing enrollment within an existing budget, while Part III analyzes the recovery of costs and explores the extent to which new sources of financing for education may be tapped.

Why attempt to reduce the unit cost of education in Africa?

Two main sets of reasons call for reductions in the unit cost:

- First, the unit costs of education at all levels, but particularly higher education, are much higher in Africa than in other countries in the same range of per capita income. Within Africa, Francophone countries have much higher unit costs than Anglophone countries.

- Second, at current unit costs, few African countries will attain their stated objective of universal primary education in the next twenty years.

How to reduce educational unit costs?

Two sets of measures can be considered:

- Improve the internal efficiency of education so as to reduce the unit cost while maintaining or improving the quality of education; in short, reduce wastage and improve organization.
- Reduce the curriculum choice or length of studies so as to permit more students to be acccommodated. This type of measure deals with the quantity-quality dilemma in education. It also touches on the "back to basics" argument, and hence requires an assessment of what is basic.

The two sets of measures might be complementary. The first set is almost universally necessary, while policy decision on the second would obviously depend on specific circumstances, and are not analyzed in this report.

On ways to reduce unit costs, the report's main conclusions are as follows:

- Reducing the average salary of teachers is generally not feasible.
- The number of students supervised per teacher may be increased either by raising the class size or by raising the teaching load of the teacher; both of these instruments can be effective.
- In higher education, though not at the primary or secondary levels, sizable returns to scale may be reaped.

- Measures to improve the flow of students within the system (reducing dropout and repetition) have usually had less effect on unit costs than anticipated, but they should be encouraged on their own merits, especially in West Africa.
- Among the relatively cheap alternatives for improving the quality of education, the provision of textbooks seems to be by far the most cost effective. Improvement in the managerial capacity of school principals would probably also be a very cost effective measure.

New way of financing education

- The most promising of these is to cut subsidies to higher education and to shift the public resources saved toward primary education -- a measure which is both cost effective and equitable. In general, it would be appropriate to reconsider the prevailing pattern of financing in which the level of subsidization usually increases with the level of education.
- The use of the proceeds of production activities in the schools is found to be potentially effective as a way to raise funds.
- Not enough is known about other measures, such as raising fees in schools or developing private education, to ascertain their scope in allowing an expansion of education.

PART I

THE PRIMITIVE STATE OF INFORMATION ON COSTS OF EDUCATION

INTRODUCTION

TO PART I

The economist is above all concerned with the optimal allocation of scarce resources. A resource is scarce when one has to make choices between its different possible uses; in other words, when there is not enough of the resource to satisfy all the claims upon it. Satisfying one need, therefore, implies forgoing the satisfaction of another need. The cost of using a given resource to satisfy a given need is the value attached to the satisfaction that is forgone.

In the case of material goods and services that may be exchanged, markets provide a mechanism that allows comparison of costs in an easy and clear way. When markets are functioning in a perfect way, prices give an accurate way to compare sacrifices and satisfaction. But education is not a good that is bought and sold in the usual sense of the word. Nevertheless, it has economic consequences for those who acquire it, and the various inputs necessary for its production are bought and sold.

It is important to ascertain that the limited resources at the disposal of the persons and/or institutions who "buy" educational inputs are used in the most effective way possible given the objectives which are pursued. It is also important, from society's point of view, to make sure that education gets its "appropriate" share of social resources. But to determine such optima, the economist has to have appropriate cost data and to make sure that they are reliable.

Before dwelling at some length upon the great unreliability of most of the information we have on the costs of education, we shall point out what types of cost data are needed and why the accounting data which are usually available are inappropriate for a proper economic analysis.

CHAPTER 1

EDUCATION COST DATA: WHAT IS NEEDED AND WHAT EXISTS

A school can only vaguely be compared with a firm selling its products on the market. Even if we discard the fact that a school has many functions and if we concentrate upon its central one, that of transmitting knowledge, we know that the "price" charged for performing this function cannot be considered as a good economic index of cost.

Fees charged to students are generally far below the total cost of education. To get cost figures, one therefore has to rely essentially on budgetary documents. But those are ill-adapted to an economic treatment and do not give a complete view of what is actually spent on education.

Accounting Data vs. Economic Costs

Total Costs

As we recalled earlier, in a fundamental sense the economic cost of using resources to do one thing is the value of what is forgone in not using the resources to do something else. All costs are therefore what the economist calls in his jargon "opportunity costs." 1/ But this raises two problems.

First, to measure real costs one has to know the opportunities which are effectively open. If there is no other possible use of the resources, there is no cost at all. This point may be important in education because the user of the resources is not always the one who pays for them. For example, teacher salaries do not represent a cost to the school principal

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1/ For a longer and more detailed discussion of these problems, see Eicher and others (1982), Chapter 3.

if they are paid directly by the ministry of education; the cost of transmitting educational programs is zero to the ministry of education if it has free access to the radio network. But there is obviously a cost to society as a whole in both cases. In developing countries, where governments are hard pressed to find enough budgetary funds to finance the school systems, the minister of education will be as interested in schemes for shifting the cost burden to some other party as in cost-reducing devices. But, from the point of view of society as a whole, only the second type of measures is truly cost reducing.

Second, some of those real costs do not entail any direct money expenditures. They are just opportunities forgone--for instance, income which could have been earned by students if they had chosen to go into active work life instead. These costs are not recorded in any transaction account; they have to be computed indirectly, through the observation of the labor market in the case of forgone earnings.

The opportunities forgone are often still more dificult to measure in money terms because they are not linked with gainful employment. Even if we assume that we are in a perfect market economy and that teacher salaries exactly reflect the "value" of teachers to the community, there is still the value of students' time to be considered, especially the value of the time they would have spent helping their parents or enjoying their leisure.

Especially in poor countries, the value of children's time to the parents may be very high, even at an early age. It is therefore high to society as a whole. But it is not a cost for the government, which does not lose anything, at least directly in the process. Confusion is often made between the point of view of the state and that of society, and economic analysis should carefully state which group is concerned in the costs being measured. [2]

But because education is financed (at least partly) through administrative channels, it gives rise to many (and often complex) income flows between the different "spenders" on education. For instance, local governments may appear to pay the teachers but actually receive a grant from the ministry of education to cover that expense; families may pay tuition fees but receive scholarships; and so on. According to the economic factor the economist is interested in, net social cost will vary; it will generally not be well represented by the expenditure item which may appear in budgetary documents.

But budgets may furnish unreliable information on costs in still another way. The budgets which are readily available are provisional. This means that they show only what the ministry concerned estimates it will have to spend during the next fiscal year. Not only may the total amount spent actually be different because new credits had to be voted along the way, but the real costs of individual items (for instance, the cost of building a given school) may turn out to be much higher than anticipated.

Actual expenditures are of course recorded, but they appear only after a considerable time has elapsed and are often much more difficult to obtain than provisional budget figures. This is one of the reasons that even statistical series showing only global expenditures may sometimes appear inconsistent (and that data for the same year may sometimes vary in successive statistical yearbooks).

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[2] We shall come back to this important question in Part III.

Cost Functions

The economist is not interested in total costs in themselves. To be able to draw conclusions, he has to make comparisons and to study the behavior of costs in different circumstances. Even if we assume for a moment that expenditures as shown in budgetary documents give a satisfactory account of (public) costs of education, this absolute level does not tell us anything about the efficiency of resource allocation or, for that matter, about the relative importance of education in total public expenditure. Data about total public budgets may be obtained directly and easily from the same sources of education budgets, but the economist will also need information about inputs and outputs to know how costs behave when the level of activity changes.

First, he has to know unit costs. For reasons mentioned earlier (and to which we shall return in Part II, Chapter 6), costs per unit of output may not be calculated readily in the case of education. Cost per student is used instead, and data on enrollment therefore have to be gathered. [3]

Second, the economist has to measure the effect of marginal changes in enrollment on unit cost--that is, to compute marginal costs. To do that, he has to dispose of coherent time series or to make cross-sectional comparisons for the same year. In the first case, he faces the danger of changes in budgetary procedures through time. In the second, he has to assume that budgetary data mean the same thing in different countries.

3/ The official, readily available figures may not be quite appropriate here either, since they often give the number of officially registered students at the beginning of the school year and not the number who really attend.

Third, the economist has to compare, through production-functions studies, the effect on cost of changes in the various inputs. He therefore has to have cost data broken down by type of input.

But anybody familiar with budgetary data, especially in developing countries, knows that the budgetary distinction between current accounts and capital accounts does not perfectly coincide with the economic distinction between variable and fixed costs. Moreover, as far as current expenditures are concerned, budgetary itemization often makes it difficult to get the cost of inputs other than that of teachers' salaries. In most cases, one can only lump these other inputs under the broad heading "other current expenditures," and even this figure is highly inaccurate when these expenditures are shared between different levels of government.

These difficulties exemplify the limitation, for relevant economic analysis, of macro data gathered at the national level. Only surveys made at the school level can give an accurate picture of the cost of inputs if we want to study individual items. For instance, even when budgetary data concerning teacher aids and supplies in general are available and accurate, they do not enable measurement of the costs of individual items such as books or modern educational media. This prevents cost-effectiveness analysis, which in turn makes impossible any policy recommendation on optimal measures for quality improvement.

In addition, capital expenditures are not always itemized. Even when figures are given for individual educational institutions, there may be a very large difference between those which appear in provisional budgets and the actual expenditure on the building project. Data on equipment do not detail the individual item, but what interests the economist is the cost of _one_ table, of _one_ blackboard, and the like. But budgetary data are also ill adapted to economic analysis for another reason: they give only a partial picture of the total cost to society of education.

Budgetary Costs vs. Total Costs

Budgetary documents at best give only public costs and therefore omit all costs financed by private sources. Yet, except in extremely centralized financing systems, there are several levels of administration which intervene, whose accounts are not easily available and are not all easily usable.

The Problem of Private Costs

Several private sources contribute to the financing of education. First and foremost are the households which undergo direct expenditures and/or sacrifices for one or more of their members. The cost of education to the students and/or their families is usually not well known. Most of the time, it is not even measured. Let us recall the most important reasons.

- Fees directly paid to the school usually represent only a fraction of the cost of education to the household and sometimes do not even exist. Other monetary contributions (for instance, to Parent-Teacher Associations, PTAs) are sometimes important; expenditures on school supplies may be higher than direct fees; forgone earnings may constitute the main portion of total cost.
- Most expenditures incurred because one child is going to school are not specific to education. For instance, expenditures on school lunches are part of expenditures on food; purchase of a school uniform is part of expenditures on clothing; and so on. But household expenditure surveys usually classify expenditures

according to broad categories of goods and not really according to the function(s) performed by those goods. Special surveys therefore have to be undertaken, at great expense.

- There is no scientifically indisputable way to evaluate forgone earnings because one has to pick a reference group whose earnings will be used to measure what the students might earn.
- The value of time spent in school is not measured in its totality by earnings forgone. If they did not go to school, students might--besides working for pay--help their parents or enjoy more leisure time.

On this last point, the cost of leisure is generally considered as equal to zero. From the point of view of society as a whole this may be acceptable, although debatable, but from the point of view of the student it certainly is not. Unless we assume that a student enjoys being in school as much as, or more than, having his own leisure time, we have to assume that going to school entails a cost equal to the satisfaction forgone.

The value of the time spent helping parents may be very important indeed in rural areas among subsistence farm families. As we shall see in Part III, this importance helps explain the reluctance of some parents to send more than one child to school. Although this cost is very difficult to measure with great precision, simple administrative reforms--such as a change in the school calendar to make school vacation coincide with the period when children are needed most on the farm--may help in reducing the cost substantially, although it may create other problems.

But, as we shall also see in Part III, to measure the impact of new fees on demand one has to know what is the actual cost of education to the households. The problem is important enough, especially in the poorest countries, to warrant devoting some effort to gathering data at the school and household levels.

Education expenditures are also financed through other private sources. Philanthropists may play an important role in some cases, but at the national level their part is often negligible, except if we include in this category churches which run a network of private schools. Firms do contribute to the financing of technical and vocational training, and international comparisons may be useful to determine the extent of their potential contribution. But exhaustive surveys of training programs financed by firms and/or by trade organizations are almost nowhere available, even in developed countries. The main reasons are that most of these programs are conducted by individual firms to adapt their workers to the firm's specific needs and that programs conducted outside of firms are organized by many different agencies.

Budgetary Data vs. Public Costs

When several levels of government are involved in financing education, available budgetary data may suffer from shortcomings.

- Only central government budget data are available in some countries, and expenditures of the ministry of education are often given as "total public expenditures."
- Even when the budgetary data at all levels are available, one has to beware of double counting because part of the expenditures at the lower levels are usually financed by subsidies from upper levels.

- Budgetary documents at the local, community level--when they exist--do not isolate all expenditures on education in a separate chapter. For instance, heating, maintenance, and repairs of schools are at best lumped with heating, maintenance, and repairs of all municipal buildings. [4]
- In developing countries, an important source of finance--foreign aid--is usually not included in budgetary documents. [5]

In conclusion, the data on education costs which are generally available are not well adapted to economic analysis. Official budgetary documents at the central government level are usually all that is available, especially in developing countries. These documents have major shortcomings.

- They do not measure costs but only expenditures.
- They usually give figures only on planned expenditures.
- They usually give figures on planned expenditures but not on how much is actually spent.
- They give figures only on public expenditures and sometimes only at the central government level.
- The categories of expenditures they distinguish are not those needed for a correct economic analysis.

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[4] For a detailed account of problems encountered and of proper economic cost measurement at the community level in a developed country (France), see Beltramo (1975).

[5] When foreign aid is included without being mentioned, which is sometimes the case, it makes economic analysis still more hazardous.

- They are not detailed enough to give accurate information on the cost of individual inputs.

Budgetary documents therefore have to be supplemented by other sources of information: local budgets, surveys of costs at the school level, surveys of expenditures on and cost of education for households.

The data currently available present, in many cases, still another danger: they are not homogeneous from one source to the next, and they are often grossly inaccurate, even for that portion of total cost which they are supposed to measure. This point is often neglected but is so important that we shall try to show some of the pitfalls which are encountered and to give concrete evidence about the unreliability of cost data in developing countries, especially in sub-Saharan Africa (in particular, in West Africa).

CHAPTER 2

THE UNRELIABILITY OF EDUCATION COST DATA: ISSUES AND FACTS

Those who have tried to compute unit costs of education know how frustrating it can be to be faced, most of the time, with time series which are plainly incoherent, with conflicting evidence from different sources, with footnotes which show that the published figures include only part of the total one seeks, and so on. But studies based on such data have been made, often sponsored by international organizations, and the results are widely used to make policy recommendations.

A careful and critical look at the data shows that some of these policy recommendations are not warranted by the existing evidence or at least that they should be advanced with much more caution than is the case at present.

We shall attempt to emphasize this point by looking at concrete examples, mostly taken from sub-Saharan Africa. This will allow us to point out some of the causes of inconsistencies and/or errors and, hence, to suggest some measures designed to improve methods of data gathering and of data interpretation.

Total Expenditures

It must be remembered that the figures which are presented in statistical yearbooks and reports from international organizations (mainly Unesco and the World Bank) are supposed to concern public expenditures on education. These data, as mentioned above, are of no interest in themselves but are necessary raw material to compute more "meaningful" aggregates. But even at this stage inconsistencies and contradictions are frequent.

Inconsistencies in Time Series

Discrepancies are frequent when budgetary data are used without checking for changes in definitions and/or in administrative organization. But Unesco has made an extremely valuable effort in the last ten years to remove all glaring inconsistencies by systematically checking with the authorities concerned and by homogenizing the data.

Some examples of sudden jumps in the total figure from year to year can still be found in issues of the Unesco Statistical Yearbook prior to 1975, but they are hard to find today. [1] But any given Unesco Statistical Yearbook gives only short time series on costs (usually fewer than ten years). Attempts to lengthen the series by referring to older Yearbooks then encounter obstacles because cost figures have often been corrected from one issue to the next.

For instance, between the 1974 and 1981 issues of the Unesco Statistical Yearbook total public expenditures on education have changed for the same year, 1970:

- From 27.2 million to 20.8 million CFAF in the Ivory Coast
- From 452.2 thousand to 551.7 thousand shillings in Kenya
- From 330.0 thousand to 407.9 thousand shillings in Tanzania
- From 48.0 million to 56.1 million kwacha in Zambia.

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[1] An extreme example of the type of checking and subsequent correction that the statistical division of Unesco sometimes has to make can be seen in 1975 figures for France. In that year the budgetary figure given by the French Ministry of Education was much lower than in the preceding years. But the only reason was that a Ministry of Universities had just been created, and this budget had not been added to that of the Ministry of Education. Unesco has played a very important and useful role in improving education cost data. The recent decision to give up these extensive checking and correcting activities is therefore much to be deplored.

Contradictions between Different Sources

Conflicting figures are numerous and can be found even in different documents and reports coming from the same organization. We shall give only one example here. Total educational expenditure in Mali for 1973 was given as 19.75 million CFAF in the 1981 Unesco Statistical Yearbook and as 17.1 million in the report L'Education au Mali (Republique du Mali 1981; confidential) prepared the same year (jointly by Unesco and the Ministry of Education of Mali).

These data have therefore to be carefully checked before being used. The discrepancies which appear between sources may result from many causes. The main ones are:

- The extent to which expenditures by other administrations than the ministry of education are covered
- The type of budgetary documents used (provisional accounts, final accounts, and the like).

The first cause is the most frequent one--and one which may strongly bias international comparisons. One example taken from sub-Saharan Africa shows the extent of that bias when the expenditures of the central government are confused with the expenditures of the ministry of education.

In the Ivory Coast, part of the budget of institutions controlled by the ministry of education is financed by other ministries. It has been estimated that, in the late 1970s, that part amounted to 27% of total expenditures. If other educational institutions controlled by other government services are included, this proportion goes up to 39% of total education expenditures by the central government.

In Malawi, at the same time, it was estimated that the contribution of all other ministries to expenditures on education did not represent more than 5% of the contribution of the central government. One can easily see that a comparison taking only the ministry of education into account would be strongly biased in favor of Malawi. But things get worse when one looks at unit costs or, rather, at expenditures per pupil.

Expenditures per Pupil

This type of data is more directly useful than total costs because it allows direct comparison between countries if the data are translated into a common monetary unit. But their computation necessitates information coming from sources other than education budgets.

Country Data

If these data are presented in local money at current prices, they necessitate only information on enrollments. But the school year rarely coincides with the fiscal year, and different choices may lead to quite different outcomes--as can be seen in the following examples taken from Mali and Upper Volta.

- Mali--cost per student in primary education, 1978:

Source	Amount in CFAF
1981 Unesco *Statistical Yearbook*	28,750
1981 report, *L'Education au Mali*	23,970

- Upper Volta--cost per student in primary education, 1977:

Source	Amount in CFAF
1981 Unesco *Statistical Yearbook*	11,130
World Bank project data	11,950

When one checks the Mali data, one discovers that one-fourth of the difference is due to the difference in the total cost figure, but the other three-fourths comes from the different way in which the enrollment figure was obtained. The Statistical Yearbook gives enrollment for the school year, which starts in the given calendar year, and the Mali report uses a weighted average of enrollment in school years 1977-78 (3/4) and 1978-79 (1/4). Furthermore, the Statistical Yearbook gives only figures for the first cycle of basic education, and the Mali report uses figures for the two cycles. When the data for Upper Volta are checked, the difference is seen to be due in totality to the fact that enrollments are for the school year 1976-77 in the World Bank data, whereas the Yearbook data for 1977 are actually for the school year beginning in October of that year--that is, the school year 1977-78.

If the fiscal year coincides with the calendar year, the weighted average method used in the Mali report is of course the only correct one. But these examples show how important it is

- To check the period for which the data are given
- To state expressly how the ratios one uses in a given study have been computed.

International Comparisons

Cross-country comparisons are often made unreliable by the fact that definitions vary from country to country. The problem of regional averages is also important.

Difficulties in international comparisons. Some of the factors making international comparisons difficult have been pointed out in the preceding section:

- Differences in coverage
- Differences in the choice of a base year for enrollments
- Unequal quality of the budgetary documents

But there is also the problem of the choice of the unit for the account

The problems of international comparisons of real incomes (or expenditures) is well known. Sophisticated methods have been devised to compare national incomes, [2] but it is not obvious that the same deflator should be applied to educational expenditures as to GNP, and the new series are not yet available for most of the poorest countries. Official rates of exchange in relation to the U.S. dollar have in recent years exhibited erratic variations which make their use rather hazardous. Utilization of the implicit GNP deflator and of the weighted average exchange rate used by the World Bank to compute its series of GNP per capita in constant U.S. dollars seems to be the least objectionable solution.

As a result, computations made by different people or by using different sources can be different. Table 2.1 gives an example for West Africa drawn from four different sources.

2/ See Kravis, Heston, and Summers (1982) and Kravis and Lipsey (1982).

Table 2.1: TOTAL PUBLIC EXPENDITURE ON EDUCATION IN PERCENT OF GNP. WEST AFRICA. SELECTED COUNTRIES AND YEARS.

COUNTRY	YEAR	SOURCE			
		I	II	III	IV
Benin	1977	4.12	4.65 a/	--	4.7 a/
C.A.R	1975	4.18 b/	4.84	5.0	5.0
Ghana	1975	4.20 b/	5.11	5.3	5.9
Ivory Coast	1975	6.66	7.02	7.4	6.3
Liberia	1976	2.14	1.97	2.6	2.6
Mali	1977	4.89 b/	4.84	5.1	5.0
Mauritania	1977	5.79	4.47	5.8	5.8
Nigeria	1976	6.57	6.47	4.7	5.5
Sierra Leone	1977	3.11	3.90	4.3	4.0
Upper Volta	1977	3.08	2.65	2.5	2.5

Sources: (I) 1982 World Bank data compiled by M. Zymelman (Education Department); (II) our own computation using Unesco *Statistical Yearbook* data (various years) for total cost and IMF or World Bank data for GDP; (III) Unesco *Statistical Yearbook* 1980, Table 4.1; (IV) Unesco *Statistical Yearbook* 1981, Table 4.1.

a/ Current expenditures only.

b/ Using Unesco data (in the other cases, World Bank data were used).

Some results are striking. For example, in the case of Ghana all sources used Unesco data for public expenditures and still came out with widely different results. In the cases of the Ivory Coast and of Nigeria, two successive Unesco *Statistical Yearbooks* give quite different figures for the same year.

Table 2.2 shows differences between Zymelman's results and ours, which used Unesco data for primary education in West and East Africa. It confirms the sensitivity of the results to choices made by the analyst and reinforces our warning about the danger of drawing hasty conclusions.

The problem of averages. Unit cost figures are often used to compare not only countries but also regions of the world and countries within a region. Regional averages are therefore widely used. Three types of problems are encountered in their computation.

First is the choice of the regions. There is a generally admitted distinction between developed and developing countries, but among developing countries different institutions make different segmentations. The World Bank distinguishes six regions, Africa being divided between three of them; Unesco distinguishes only five, two of them (Oceania and North America) being shared by developing and developed countries. Countries may also be grouped according to criteria other than their geographical situation. For instance, grouping according to level of per capita income is used in the last *Education* Sector Policy Paper of the World Bank (1980a). In this paper, we shall follow the World Bank classifications but will also show that some other groupings might be useful.

Table 2.2: COST PER STUDENT IN PRIMARY EDUCATION IN PERCENT OF GNP PER CAPITA. SUB-SAHARAN AFRICA. SELECTED COUNTRIES AND YEARS

COUNTRY	YEAR	SOURCE	
		I	II
Benin	1977	18	20.5
C.A.R.	1975	27 a/	18.5
Ghana	1975	11 a/	7.5
Ivory Coast	1975	21	22.9
Mali	1977	55 a/	45.5
Mauritania	1977	44	43.9
Nigeria	1976	18	13.1
Upper Volta	1977	39	33.0
Botswana	1978	20.85	16.6
Burundi	1978	34.09	32.1
Madagascar	1977	12.73	13.0
Mauritius	1978	16.72	20.5
Rwanda	1975	33.92	22.2
Somalia	1978	44.41	33.8
Swaziland	1977	7.38	7.4
Uganda	1975	11.69 a/	13.0
Zambia	1975	13.57 a/	14.5

Sources: (I) 1982 World Bank data compiled by M. Zymelman (Education Department); (II) own computations using Unesco Statistical Yearbook data for expenditures and enrollments and World Bank Atlas for GNP per capita.

a/ Unesco data.

Second is the choice of the base year. Very often data are not available for all countries for the same year. When the number of countries in a region is small, the choice of an adjacent year for some countries may produce different coverages according to the choice made.

Third is the choice of statistical method. Several averages may be computed: arithmetic or geometric, weighted or unweighted, and so on. The choice will depend upon the objective. For example, if we want to compare the "effort" in favor of education made in different countries, each country should be given the same weight; if we want to avoid giving too much influence to extreme situations, a geometric average should be preferred to an arithmetic one. But, as a matter of fact, averages which have been computed in a different way are often compared as if they were the same. And judgments are passed on individual countries which would be reversed if other averages were used.

Two examples will illustrate this point. First, two recent studies--one by the Unesco Office of Statistics (Unesco 1982b) and one by M. Zymelman of the World Bank (1982 data, Education Department) report trends in world educational expenditures by region during the 1970s. A comparison of the results for developing countries show striking differences. The Unesco study indicates that, on average, the ratio of educational expenditures to GNP has increased from 3.3% in 1970 to 4.0% in 1979, whereas Zymelman finds that it has gone down from 3.29% in the early 1970s to 3.16% in the late 1970s. Quite different conclusions will of course be drawn according to the study used as reference. Part of the difference may be because the two periods of observation are not exactly the same in the two studies, but most of it comes from the difference in the statistical methods used in each case. Unesco used arithmetic averages weighted by GNP in each country, and Zymelman computed straight geometric means of country ratios.

Second, regional averages were computed by us (Eicher and Orivel 1980) for Unesco and by the World Bank for its Education Sector Policy Paper (1980a), in both cases for the year 1975. If we compare those two studies, we get the following results for higher education by level of GNP per capita (in U.S. dollars):

	Less than US$265	US$265 to US$520	US521 to US$1,075	US$1,076 to US$2,500
World Bank averages	534	675	1,757	1,290
Our averages	1,332	1,577	1,163	1,847

These striking differences should not be due to the use of different data sources because Unesco data were used in both cases. They can be explained in part by the statistical methods. The World Bank Sector Policy Paper apparently used geometric averages, and we computed unweighted arithmetic averages. Arithmetic averages weighted by number of students in each country would give still different results. For instance, for the less-than-US$265 group we would have the following choices:

- Our unweighted arithmetic average: US$1,332
- World Bank geometric average: US$534
- Weighted arithmetic average: US$147.

The last average is overwhelmingly weighted by the presence of India, which represents 90% of the total number of students but only 74% of the expenditure--so that it is close to the figure for that particular country (US$123), which is among the lowest in the world (only Bangladesh and Burma spent less per student in 1975).

Another cause of differences probably resides in the number of countries included in each computation and in the original country data used in each case. [3] The geometric average for the countries included in our study and using Unesco Statistical Yearbook data is US$738 (instead of US$534 for the World Bank figure) for the less-than-US$265 group. It is US$862 (instead of US$675) for the US$265-to-US$520 group, US$648 (instead of US$1,757) for the US$521-to-US$1,075 group, and US$1,382 (instead of US$1,163) for the US$1,076-to-US$2,500 group.

This state of affairs is quite unsatisfactory indeed. These data are actually used for guiding policy recommendations, as can be seen in this excerpt from the last World Bank education sector report on China (World Bank 1983, p. 54): "The unit cost in higher education was about $1,150 in 1979, or about $880 in 1975 prices. This unit cost averaged $534 and $675, respectively, in 1975 in the comparative country groups. The reasons for the high unit cost in China have been enumerated .... It should be possible to reduce unit cost without jeopardizing attempts to raise the quantity of higher education."

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[3] We have not been able to get the regional country data used by the authors of the Sector Policy Paper, but we suspect they have included countries for which data are available not in the Unesco Statistical Yearbooks but in special Unesco reports.

This conclusion, based on the average found in the Education Sector Policy Paper (World Bank 1980a) for the less-than-US$265 and for the US$265-520 group, would be reversed if our own average of US$1,332 or US41,577 were used. China would then be found to have rather low unit costs for higher education, and no recommendation to try to lower these still further should be made. On the contrary, the use of the arithmetic weighted average would strengthen the conclusion and the recommendation. Good arguments can be given in favor of using a weighted average. In this particular case, it is probably more useful to compare China with India than with the many small African countries which are included in the sample. But great care should be exercised to explain the method used, not to compare averages computed in different ways, and also to satisfy oneself that the choice made is based on sound logical foundations. The unreliability of cost data is further confirmed by the observation of specific cost items.

Cost of Teachers

Because teacher salaries are by far the main cost item, at least in primary and secondary education, it is most important that the cost of teachers should be recorded with accuracy and in detail. It is indeed the cost item which is best known. But the figures given do not always represent the total wage bill of teachers and do not always allow for an economic study of wage levels.

Problems of Interpretation of Budgetary Documents

One should first mention the case where wages and salaries of teachers do not appear at all or do not appear as such in the ministry of education's budget. Sometimes salaries of all public servants appear in the budget of a single ministry. Sometimes they do appear in the budget of the ministry of education, but as a transfer to the other ministry. This, for instance, was the case in Malawi until 1977 for primary school teachers. As a result, the percentage of expenditures represented by teacher salaries suddenly went up from 15% to 92% between 1977 and 1978, a change in the ministry of education's budget which should be baffling to anybody unaware of that purely formal change in budgetary procedure.

More frequent, but no less important, is the case of retirement and disability pensions. In most countries where teachers are public servants, pensions are administered by a special office which is administratively linked with the ministry of the interior or with a special ministry. The rather complicated task of reapportioning to the ministry of education the net expenditures on teacher pensions is necessary only if we are interested in the cost of teachers to society or to the state. As far as the ministry of education itself is concerned, there is no cost involved. [4]

Another problem is that of temporary teachers. Secondary school graduates teach for one or two years in primary schools on a voluntary or compulsory basis in several countries in West Africa. These temporary teachers are paid, at a much lower rate than permanent teachers, and the amount apportioned to them does not usually appear on the same budgetary line as for other teacher salaries. But these sums still have to be included if one wants a clear picture of the evolution of the wage bill, of the average teacher's salary, and of the average salaries of each teacher category.

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[4] If the pension fund is totally or mainly financed by deductions from gross salaries, which the ministry of education afterward transfers to the administration concerned, the cost of pensions is included in the budget, at least in part.

Only a careful inventory of all categories of teachers, of their status, and of their pay scale may help in getting correct salary averages and thereby correct comparisons. It would help avoid contradictions which may be found between different reports, sometimes produced by the same institution. One example concerning Togo may shed some light upon the danger of too hasty computations.

World Bank education sector data of 1978 state that, in primary education in Togo, recurrent costs per student are low but that teachers nevertheless receive high salaries relative to the income level of the country--for primary school teachers, on the average about eight times GDP per capita. But the World Bank staff appraisal data for the First Education Project in Togo state that primary teachers' salaries are only six times GDP per capita, and in the Report and Recommendations of the President one reads that the lower percentage of GNP spent on primary education is due to "low teacher salaries." A careful analysis of the official data, however, shows the following.

- The figure given in the Bank's education sector data is correct only if nonqualified teachers (monitors) are excluded. If they are included, one finds six times GDP, the figure given in the Appraisal Report.
- Comparatively, teachers salaries are not very high in Togo (as can be seen in Table A.3 of the Annex).

This example unfortunately is not unique. Rather, it illustrates the normal state of affairs and strongly points to the necessity of taking prompt action to improve the gathering and use of cost data.

In some cases, the figures appearing in provisional budgets are not of much significance because salaries are not always actually paid out or are paid after a long delay, sometimes in the next fiscal year. Nevertheless, only in-depth surveys of teacher salaries can give information on effective disbursements.

Teacher Salaries and Teacher Costs

To get the total cost of teachers to society as a whole and to each group concerned, it is important to know not only what is the salary paid to each category of teachers by the official employer but also what the teachers get from other sources. There may be an important gap between the official salary for one post and the total income of one teacher for several reasons.

o Teachers usually get fringe benefits which are not included in the budget. The most common of these is free lodging, which is supposed to be guaranteed to primary school teachers in most Francophone West African countries, for instance, but is usually provided by parents in rural areas through self-help building schemes. But there usually are also provided may gifts of food or other goods, which may represent a sizable part of total income and are in any case a sizable cost to some families. This aspect of education to the households has never been studied in a rigorous way, at least to our knowledge. Only well-designed household expenditure surveys could provide the necessary information.

- o Teachers have sometimes more than one teaching job. The most common case is that of public school teachers who also lecture in private schools. This practice, which is widespread in many countries, may partly account for the fact that several studies show much lower costs per student in private schools than in public schools. [5] More detailed studies of this problem should help in choosing optimal cost reduction measures. For instance, increasing teaching loads might have unfavorable effects on private schools and induce an influx of students to public shools, which in turn would have an effect on costs.

Student Aid

Student financial aid is sometimes very high, especially at the tertiary level. It represents a heavy burden on some governments, especially in Francophone West Africa. But the costs are often difficult to evaluate in full for two reasons.

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[5] Two recent examples from West Africa will illustrate:

- o For the Ivory Coast, the Yearbook of Education Statistics (Enseignment et Formation en Cote d'Ivoire--Statistiques. Annee Scolaire 1978-79) gives the following data for average teacher salaries (Republique de Cote d'Ivoire 1978-79):

	Public	Private
Primary	48,877 CFAF	22,287 CFAF
Secondary	290,000 CFAF	105,629 CFAF

- o For Togo, a 1975 Unesco report (1975b) gives the following figures:

	Public	Private
Primary	6,675 CFAF	5,544 CFAF
Secondary	26,756 CFAF	22,716 CFAF

The Problem of Scholarships to Students Abroad

In most of sub-Saharan Africa, many students go abroad either after finishing high school or to do graduate work. A sizable proportion of these students get scholarships from their own government. But these scholarships do not always figure in the budget of the ministry of education and generally are counted apart from the "domestic" scholarships. This explains why figures from different sources are sometimes quite different for the same year.

For example, in Mali in 1978 we get the following three evaluations for the total for all levels (in thousands of CFAF):

Source	Amount
1981 World Bank data	5,500
1981 report, L'Education au Mali	3,723
Unesco Statistical Yearbook	5,518

The difference between the figure given in the Mali report and the other two sources is almost totally attributable to the fact that this report does not include scholarships to students abroad.

The Problem of "Other Student Aid"

Scholarships are not the only aid given to students. In West Africa, one must also include subsidies to student restaurants and to student dormitories, transport subsidies, and, according to the country, various subsidies to help cover other expenditures.

Total student subsidies are never given in official statistics, and they are very difficult to compute because of their diversity and the number of accounts which have to be looked into. We have attempted to make such an evaluation for the Ivory Coast (see Chapter 9 of Part III of this report, under "Households. Higher Education"), but more detailed studies should be undertaken in a sample of countries.

Other Current Expenditures

This term was used in Unesco Statistical Yearbooks until 1981 to cover all expenditures except teacher salaries, student aid, and (sometimes) cost of administration. These data should be very useful to the economist because they are supposed to give the cost of teacher's aids and therefore to have an influence on the quality of education. But published data have two drawbacks which make them generally quite useless: they are never detailed, and they exhibit too many inconsistencies. Let us give a few examples of this last problem.

Cross-country Comparisons

Table 2.3 gives figures in U.S. dollars for selected countries during the late 1970s. Clearly, these figures are not representative of what is really spent for teaching materials, at least in countries such as Italy and Denmark, and the differences among developing countries look suspiciously high.

Table 2.3: "OTHER CURRENT EXPENDITURES" PER STUDENT IN PRIMARY EDUCATION. SELECTED COUNTRIES AND YEARS.

COUNTRY	YEAR	EXPENDITURE (US$)
Burundi	1976	0.47
C.A.R	1978	1.5
Congo	1978	0.02
Ivory Coast	1978	5.6
Mali	1978	2.1
Togo	1978	1.0
Upper Volta	1977	0.8
Malawi	1975	0.03
Rwanda	1978	1.3
Chile	1978	16.98
El Salvador	1975	1.0
Venezuela	1975	0.49
Thailand	1978	0.97
Algeria	1978	14.0
Denmark	1979	0.27
Italy	1978	0.008

Source: Unesco Statistical Yearbooks.

Time Series

Data are not available for more than two or three years in most developing countries. But what data exist confirm the unreliability of this source of information. For instance, according to Unesco *Statistical Yearbooks*, in the People's Republic of Congo expenditure per student in primary education moved from US$1.3 to US$0.02 between 1976 and 1978 and in higher education from US$612 to US$18. In the Ivory Coast between the same two years, the shift was from US$13.3 to US$5.6 in primary education and from US$429 to US$0 in higher education.

There is no need to multiply the examples to show that these data should not be used to make an economic analysis. The main reasons why this is so are the following.

- The largest part of the expenditure on teaching materials in most countries is shared between local authorities and households. Therefore, only surveys of schools and of household expenditures could give us the information needed, and very few reliable surveys of the kind are available for developing countries.
- The figure for "other current expenditures" is often obtained by taking the difference between total cost and teacher salaries plus whichever other types of expenditures can be identified.

Because the amount represented is small in any case in poor countries, the errors which may have been made in calculating other aggregates are automatically translated in this budgetary line and may explain most of the inconsistencies.

Capital Expenditures

Two problems often make budgetary figures unreliable as measurements of cost. First, budgets give only provisional amounts. The difference between what was foreseen and what is actually spent is usually much higher when investments are concerned.

Second, in developing countries a large part of building and equipment expenditures comes from foreign aid. Because the donors are often many and the channels through which the aid is funneled highly varied, it is often difficult to find detailed data.

PART II

COST ISSUES IN EDUCATION

INTRODUCTION
TO PART II

That education cost data are often unreliable is more of a problem today than it was earlier because of the severe financial constraints most governments are facing, especially in developing countries. It certainly impairs the capacity of economic analysis to help make policy recommendations.

Education policies should, in the medium term, reconcile two objectives: the quantitative expansion of the school system (especially in countries where universal basic education is still far away), and the effectiveness of schools (given the overall objective of social development). The objectives must be met subject to budgetary constraints, and it is felt that the budgetary bind is getting so severe that it may prevent reaching these goals if more cost-effective procedures are not found or if cost-recovery measures are not implemented.

The first cost issue discussed is therefore the trend in the total cost of education. Is total cost rising so fast that it will soon be impossible for most governments to "foot the bill"? Is it already "too high"? Is the trend true everywhere? If it is, what are the most effective cost-saving measures?

Because teacher salaries represent a high percentage of total cost, we shall next concentrate on that issue and try to show if and how the total wage bill for teachers can be reduced. But some of these cost-reducing measures have negative effects on the quality of education. Because educational quality is generally considered as already "low" in low-income countries, what are the most cost-effective and the least costly quality-improving measures?

In addition to these issues, school systems are still growing fast in most developing countries, especially in sub-Saharan Africa. Can we expect to reap economies of scale and therefore to have lower costs per student in the future? Under what conditions, and to what extent?

Finally, high repetition and dropout rates are observed in many developing countries. It is generally considered that lowering them would contribute in an important way to improving the cost effectiveness of education, partly by reducing the level of expenditure per graduate. Does this really mean that automatic promotion procedures, for instance, would proportionally reduce costs? If not, under which conditions would this reduction be effective?

CHAPTER 3

THE RISING TREND OF TOTAL COST

After a decade of "almost euphoric belief in education" (Husen 1979) in the 1960s, education has entered a state of financial crisis. This crisis is partly the consequence of the preceding growth of educational expenditure, which, because of its exponential character, could not be sustained. It has been accentuated by the world economic crisis that started in 1974. But, to some extent, it is also the result of a crisis in confidence.

In developed countries, on the one hand, campus unrest in the late 1960s led many governments to see universities more as training grounds for revolutionaries than as institutions generating highly qualified manpower and new scientific knowledge. Young people use universities more and more as "parking lots" when the universities are tuition free and tend to desert them when they are expensive. In developing countries, on the other hand, demand for education is in general still very strong. Most parents still feel that a university degree is the key to well-paid and agreeable jobs. But governments are sometimes less eager, and almost always less able, to finance rapidly growing school systems.

As was shown in Part I, official country statistics are often unreliable, especially in developing countries, and one is faced with much incoherence in the available data. But broad trends may be detected, especially when time series constructed from different data sources point in the same direction. Before looking at the facts, a few methodological problems concerning the choice of indices have to be solved. After we have looked at the facts, some policy conclusions will be attempted.

Methodological Problems

Time series data are meant to answer two sets of questions. First, what is the trend in total cost of education? [1] Is it really rising everywhere? By how much? Second (and more difficult), has the ceiling of what can be done been reached, or will it be reached in the near future? Where?

A time series of total public expenditures on education by itself would be of no use to answer these questions. Even supposing that there is no inflation during the period under consideration, so that money expenditures may be considered as representing real expenditures, the meaning of a sharply rising trend in total expenditures on education will be quite different according to the initial percentage of total budget going for education and to the trend in total budget.

For instance, if the total budget increases annually by 10% in real terms and if the education budget increase by 50% but represents at the start only 1% of the total budget, after ten years the education budget will have multiplied by almost thirty, its percentage of the total budget will have grown to almost 20%, but only 30% of the (real) increase of total budget will have been spent on education (which, presumably, can be afforded if a high priority is accorded to education).

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[1] Of course, it would be interesting to have data on total costs for all parties involved. But data on household expenditures on education are usually not available, even in developed countries. And the problem we directly address is the problem of public finance--namely, that of the financial burden to the state (defined as representing both central and local governments). Therefore, we shall look only at data on public expenditures for education, adding later some reflections on costs.

The rate of increase in public expenditures on education may, however, be of some use in comparing countries. But this rate depends on many other things besides the relative priority given to education, and first among these is the rate of increase in the overall budget. From a long-term point of view, it also depends on the amount of resources produced in the country.

What we are directly interested in is some kind of measurement of "effort" in favor of education in order to see whether that effort is possible given the resources. [2] But this effort must be observed from two points of view: that of the state, which has to face a general budgetary constraint and "political" allocative constraints in the overall budget, and that of society as a whole, which has to decide which share of total resources it is ready to allot to education through public channels.

Because we need dimension-free indices to be able to make valid comparisons through time and space, the two following simple indices seem to be both possible and acceptable:

- Representing "fiscal effort": percentage of public resources spent on education (education budget x 100/total budget)

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[2] This so-called effort is partly constrained by factors other than budget limitation. Within the budget constraint, the effort will be different in two different countries, even though their "preference" for education is the same, if the number of potential users is different. Other factors are also interesting to study. For one attempt in that direction, see Zymelman (1976).

- Representing "national effort": percentage of national resources spent on education (education budget x 100/GNP) [3]

Of course, these indices are not perfect. In some cases they may give a strongly biased evaluation of effort. For instance, "fiscal effort" as defined above will tend to appear smaller in countries where the state directly undertakes many productive activites than in predominantly free-enterprise economies. "National effort" will tend to appear higher, other things being equal, in developing countries because GNP is underestimated but not public expenditures on education, which are made in money and appear in totality in budgetary documents. But, once again, if one is interested mainly in evaluating broad trends, if one does not seek to draw precise conclusion for any given country, these indices are quite adequate.

The Data and Their Interpretation

The Facts

Time series have been computed for national effort (percentage of GNP spent publicly for education) for the period 1960-76 for about 140 countries (by us), for the period 1972-79 for a selected group of developing countries (by Manual Zymelman of the World Bank's Education Department in 1982), and for the period 1970-78 (by Unesco, 1982b). Averages for developed and for developing countries are given in the last Education Sector Policy Paper of the World Bank (1980a) for selected years between 1960 and 1974.

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[3] GNP is used because it is the most commonly available national aggregate. There may be good reasons to prefer another aggregate from a purely logical and abstract standpoint, but we shall not undertake to discuss these merits here because the interest of such a development is purely academic.

Although the data for individual countries do not coincide from one series to the next for reasons explained earlier, the trend is quite clear.

- During the 1960s, developed and developing countries followed about the same pattern, increasing their public expenditures on education much faster than GNP. As a result, the index of effort (calculated as the arithmetic average of national efforts) went up from 2.9% of GNP in 1960 to 4.15% in 1970.
- This trend extended into the 1970s, but:
  - The rate of increase of public education expenditures slowed down between 1970 and 1974, although the rate of increase of GNP was on the average higher than in the late 1960s. As a result, the index of effort increased less than before (4.3 in 1976).
  - The pattern ceased to be uniform. Developed countries increased their effort more than developing countries; different regions behaved in different ways; the coefficient of variation between countries increased considerably.
  - Since the world economic crisis began in 1974, the developed countries have on average stabilized the share of GNP they spend publicly on education (although this is not true everywhere, especially in Western Europe), but developing countries still on average increase their effort.
  - Among developing regions, Latin America has decreased its effort, Asia has more or less stabilized its, and sub-Saharan Africa has kept increasing its.

If we look at the fiscal effort, the trend is almost the same, but the contrast in recent years between regions and individual countries is still more visible than for national effort. The salient facts which must be highlighted are the following.

- Between 1960 and 1974, the part of the national budgets allotted to education has increased by around 35%, going from around 11% to around 15%; these percentages are about the same, on average, in developed and in developing countries.
- Since the beginning of the 1970s, developed countries as a whole have started reducing the percentage for education in the public budget, and the movement is almost universal. It touches North America as well as Japan, Eastern Europe as well as Western Europe. But in developing countries the opposite tendency was quite general until the mid-1970s. Since then, many developing countries have started stabilizing their fiscal effort, and a sizable minority have reduced it.

These facts show us two things. First, the effort in favor of education during the last twenty years or so has really been tremendous. Total public expenditures were almost multiplied by 3.5 in real terms; national effort increased by around 75% in developing countries and by around 50% in developed countries; fiscal effort increased by more than one-third in both groups in less than fifteen years.

Second, this effort is now leveling off. In developed countries, fiscal effort is even decreasing, and national effort is no longer increasing everywhere. In developing countries the average trend is still upward, both for fiscal and for national effort, but this average hides the fact that the countries where fiscal effort has ceased to increase or is decreasing henceforth represent a majority. In Latin America a majority of countries have reduced their national effort, and in Asia the tendency is toward stabilization. Only sub-Saharan Africa [4] stands out as a group with continued upward trends.

Before attempting to interpret the general slowing down, let us go a little more deeply into the case of Africa. Most sub-Saharan African countries became independent only after World War II, the majority of them around 1960. Their school systems were little developed, and most of them had to undertake setting up a universal primary education system as well as developing or creating secondary and higher education.

Their national and fiscal effort was, from the start, above average. They doubled the percentage of GNP spent publicly on education since 1960. In many of them that percentage was above 4% around 1974, and they were on average almost one point above the rest of the developing countries.

The evolution of national effort from 1970 to 1978 is summarized in Table 3.1 and is further detailed in Tables A.1 and A.2 of the Annex.

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[4] The Republic of South Africa, classified as a developed country, is excluded.

Table 3.1: EVOLUTION OF THE PERCENTAGE OF GNP SPENT ON EDUCATION IN SUB-SAHARAN AFRICA. 1970-78.

REGION OR GROUP OF COUNTRIES	1970 (1)	1974 (2)	1976 (3)	1978 (4)
Sub-Saharan Africa	3.57	3.52	3.64	4.11 (4.39) a/
West Africa	3.39	3.54	3.79	4.39 (4.46) a/
East Africa	3.79	3.48	3.42	3.77 (3.93) a/
Former French colonies	3.51	3.69	4.02	4.67 (4.81) a/
Former British colonies	3.92	3.53	3.70	4.04

Source: Col. 1: Unesco *Statistical Yearbook* 1980, Table 4.1. Cols. 2,3,4: own calculations using Unesco *Statistical Yearbook* data from total public current expenditures on education and IMF International Financial Statistics for GNP (except for the Central African Republic, Chad, People's Republic of Congo, Guinea, Mali, Niger, Somalia, for which World Bank data were used).

Note: All the percentages have been calculated by computing an unweighted arithmetic average of country ratios.

a/ Numbers in parentheses are percentages excluding countries for which no data were available for preceding years and countries for which data did not come from the same source as in preceding years.

The most striking fact from the table is the considerable increase in effort since the beginning of the world economic crisis in 1974. But one also may note that the increase is the greatest in former french colonies, former British colonies being closer to the average.

A look at individual country data (see Tables A.1 and A.2 in the Annex) shows that since 1976 the increase in effort is quite general. The contrast between sub-Saharan Africa and most other regions is therefore quite marked and needs a special explanation.

Interpretation of the Facts

To interpret the general slowing down (outside of Africa), the question will first be asked whether the circumstances which made governments embark on such an effort are changing in such a way that some relaxation is warranted. Then a little more rigorous study of the determinants of public effort in favor of education will be undertaken.

The slowing down of education expenditures was not caused by saturated demand. Because the effort produced during the 1960s was exceptional, one likely hypothesis would be that most countries had reached their goals around 1970 and henceforth gave priority to other, more urgent social concerns such as health, communications, and the like. In developing countries, one topmost priority is universal basic education. Was that goal achieved, or at least close to being achieved, at the beginning of the 1970s?

Time series on total enrollment in primary education are impressive because they show a total of almost 265 million pupils enrolled in 1970 and an average rate of increase in enrollment of 5.1% per year between 1965 and 1970. But the gross enrollment rate, which considerably overstates the true proportion of children who are in school, was only 70% in 1970, and it had reached that level partly because of an increase in the repetition rates. Net enrollment rates are much less encouraging. Although enrollment kept increasing in the 1970s, the situation in 1977 was as shown in Table 3.2.

Table 3.2: NET ENROLLMENT RATES IN PRIMARY EDUCATION.
SELECTED REGIONS, 1977.

REGION OR GROUP OF COUNTRIES	MEAN NET ENROLLMENT RATE	MEDIAN
32 poorest countries	50	53
Africa	52	53
West Africa	44	45
East Africa	56	58

Source: Unesco *Statistical Yearbook* 1980.

The conclusion is clear. By the end of the century in most of the poorest nations in Asia and in Africa, universal primary education will not be reached, and in some, especially in sub-Saharan Africa, it will still be far removed.

Actually, a closer look at the individual country data shows that many of the countries where the enrollment rate was very low did not catch up in recent years. In Africa, for instance, six out of the nine countries which had a net enrollment ratio lower than 30% in 1970 made little or no progress during the 1970s. But this does not mean that, in most of those countries, "by the end of this century, every child will probably be able to enter something called a school" (Heyneman 1983). The problem is more to keep the children in school, and to make sure that they acquire the basic skills while in school, than to make them attend.

Unfortunately, the crude indices often used to measure the "quality" of primary schools show a shocking difference between developing and developed countries and tend to point to a lowering of the quality in the first group, especially in Africa.

o Total cost per student in primary education has been going up, but it is still much below what is spent in developed countries. In 1976, the situation was the following (in U.S. dollars): 5/

	Total Cost per student	Ratio to (a)
(a) North America	1,734	---
(b) Europe	549	1:3
(c) Oceania	325	1:5
(d) Latin America	87	1:20
(e) Asia	79	1:22
(f) Africa	50	1:35

The contrast is striking between developed and developing regions, and the situation in Africa appears, as usual, particularly unfavorable. But these figures may be misleading because they represent not only differences in effort but also in cost levels. Data on current expenditures other than salaries may be more interesting to examine.

o "Other current expenditures" are, as we have seen, generally very poorly reported in official statistics. But several detailed surveys (as well as most reports on primary education) show that, in Africa at least, these expenditures are extremely low and have a tendency to regress in absolute and relative terms. As a result, in most countries there is only one textbook for several pupils, and in some countries, at least in rural areas, even the teacher himself has no book; there are not enough benches and tables to seat the pupils; there is no blackboard, not to mention the more

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5/ For more details see Eicher and Orivel (1980), p. 18.

sophisticated teaching aids. And it is not by spending only one to three dollars per pupil (which is what is effectively spent in many poor countries) that this situation can be remedied. This fact is only beginning to be known and its consequences on school achievements to be understood. [6]

o Pupil-teacher ratios may be used to measure the trend in quality if we assume that they were generally "too high" (compared with what is generally considered as a maximum) at the start. Unesco data show that they have been deteriorating in seventeen of the twenty-seven African countries for which data are available between 1970 and 1977; they have improved only in five. In Latin America and in Asia the situation is better, although in no way satisfactory, as can be seen in Table 3.3.

Table 3.3: EVOLUTION OF THE PUPIL/TEACHER
RATIO IN FIRST-LEVEL EDUCATION.
BY REGION, 1970-77.

REGION	NO. OF COUNTRIES IN WHICH THE RATIO HAS IMPROVED (two or more points)	NO. OF COUNTRIES IN WHICH THE RATIO HAS REMAINED MORE OR LESS CONSTANT	NO. OF COUNTRIES IN WHICH THE RATIO HAS WORSENED (two or more points
Africa (27 countries)	5	5	17
Latin America (11 countries)	3	4	4
Asia (14 countries)	5	5	4

Source: Eicher (1982), p. 61.

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[6] For a forceful statement on these points, see Heyneman (1983).

In conclusion, by no stretch of the imagination can one attribute the relaxation of the effort in favor of education to the fact that educational needs were beginning to be considered as largely satisfied. A more thorough investigation of the determinants of public spending on education is therefore in order, as well as a look at the medium-term consequences of a pursuit of the present effort.

The determinants of education expenditures. Assuming there is a demand for primary education on the part of households, the amount spent will depend on the demographic factors which determine potential enrollment and the effective enrollment ratios, on economic factors which determine the capacity to finance education, and, given these constraints, on the attitude of the government toward education.

Three models [7] using data for 122 countries and for the period 1960-76 gave the following results:

- Enrollment ratio in the 6-11 age group is the most important explanatory variable for the national effort, and the rate of change in this ratio is the most important explanatory variable for the increase in effort between 1960 and 1976. [8]

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[7] Details about their structure and results can be found in Eicher and Orivel (1980), pp. 42-55.

[8] Of course, the results of multiple regression models do not prove causality but show only correlation. One could also argue that the level of education services provided explains the rate of enrollment. But this is a dialectic process; when the pupils are enrolled, one has to keep offering the services.

- GNP per capita is also important but less significant, and the regression coefficient is very small--which confirms that rich countries do not on average spend on education a much larger proportion of their GNP than do poor countries. The rate of growth of GNP between 1960 and 1976, however, had a strong link with the rate of increase of public expenditures during the same period but no link with the change in effort.
- Cultural traits seem to play a fairly important role, since the countries in some cultural areas spend significantly more than the average on education and others significantly less, other things being equal. Among developing countries, "French-speaking" Africa stands out strikingly (this variable comes out third in the step-wise regression, and the "effort" of Francophone African countries is one-third larger than that of the others) and "English-speaking" Africa a little less so (the variable comes out fourth, and the "effort" is a little over one-fourth larger than that of the others).

Recent data compiled by Manuel Zymelman (1982, World Bank, Education Department) confirm and complete this diagnosis. They also show the "atypical" behavior of West and East Africa. Enrollment ratios have much more influence on effort in favor of education than what Zymelman calls the "demographic burden factor" (measured by the ratio between the age cohort considered and total population), and there are important differences between countries in unit costs of education relative to GNP per capita. By considering separately each level of education, Zymelman gives further insight on "national preferences."

The conclusions to be drawn from these studies are clear. In developing countries in general, three causes contributed to the slowdown in education spending:

- The slowing down of economic growth
- The relative decrease in the pressure of demand for education
- A change in government attitude toward education.

The relative contribution of each of these causes is far from being uniform from one region to the next and even within a given region.

In sub-Saharan Africa the third cause is not yet at work in most countries, and the pressure of unsatisfied demand has forced governments to increase the percentage devoted to education in a stagnating GNP. But there is still a long way to go before most of these countries come close to universal primary education and before adult illiteracy becomes the exception. What can be said about future probable trends and their consequences?

Future trends and problems. It is extremely perilous to try to extrapolate past trends. In the field of education, one has only to recall the extremely "optimistic" forecasts published in the "Europe 2000" plan or studies made for Unesco in the 1960s, which anticipated that universal primary education would be reached in most countries around 1980. But it is useful to show what will happen if what is generally considered as the minimum effort in favor of education is pursued until the end of the twentieth century. Assuming that the trend in enrollment observed in developing countries between 1960 and 1974 will be maintained until 2000 and that unit costs of education will increase at the same rate as GNP per capita, a simulation for developing countries shows that: [9]

- The gross enrollment rate in primary education will have the following evolution:

	1970	2000
Developing countries as a whole	70.8	92.9
Africa	59.3	95.4
Latin America	102.4	130.6
Asia	66.4	81.4

This shows that, if rates of enrollment progress in the 1980s and 1990s as they progressed in the 1960s and the 1970s, universal primary education will be reached in Latin America before the end of the century but that Africa will still be rather far from it and Asia still farther. [10]

- The percentage of GNP spent (publicly) on education will have grown in the following way from 1975 to 2000:

Africa	From 4.8 to 10.6
Asia	From 3.8 to 5.2
Latin America	From 3.3 to 5.5

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[9] See Eicher (1982), pp. 61, 64. An earlier simulation, using a fictitious country and reaching broadly similar conclusions, can be found in Hultin and Jallade (1975).

[10] These are gross rates. Net enrollment rates which show the true proportion of school-age children who really are in school are, on average, at least 20 points below gross rates in developing countries. The poor performance of Asia is the consequence of the slow growth in enrollment rates observed between 1960 and 1974.

These results are striking inasmuch as they show that, although while increasing substantially their "national effort" on education, two regions out of three will not succeed in coming close to universal primary education at the end of the century. The "effort" to be undertaken does not seem unmanageable in Latin America and in Asia, but it clearly looks out of reach in Africa. At present, no country comes close to spending almost 11% of its GNP on education. International comparisons tend to show that there is a ceiling to this "effort" at about 8% of GNP, and that in many countries the competition from other "social concerns" is growing fast. The overall situation will be satisfactory in quantitative terms only in one region, Latin America, where, besides universal primary education, one observes that secondary school enrollment will almost triple and that tertiary education enrollment will almost quadruple.

But the quality of education, by assumption, will nowhere increase substantially. A policy which would aim simultaneously at universal primary education, an improvement in the adult illiteracy situation, a substantial increase in secondary and higher education enrollments, and quality improvements would most probably be out of reach everywhere. 11/

From the observations and analysis of existing data made in this chapter, one thing is clear. Governments do have good reasons to be concerned about the rising trend of total costs and about their ability to finance those costs in the future.

11/ Of course, it must be once again emphasized that regional averages hide important differences between countries, and, therefore, that these conclusions do not apply to all developing countries. But it is safe to say that most developing countries will face this problem.

If nothing is done to reduce unit costs and/or to improve the cost-efficiency ratio of educational services, the present situation, unsatisfactory as it is, can only deteriorate in the future in many developing countries and, most probably, in the majority of sub-Saharan African countries. But a comparative analysis of public expenditure trends also shows that, given the demographic and financial constraints, governments do exert a certain degree of "political will."

Of course, this does not explain the totality of the difference in what we call national effort between any two countries. Part of it comes from historical social choices. Some countries feel that it is better to leave a large part of the financing of education in the hands of households, and some think that this type of service should be provided almost free to the consumer. As a matter of fact, what we call national effort is only that part of a larger "societal effort" which is assumed by public authorities, and differences in national effort may be partly compensated by differences in "household effort."

Yet the multivariate models show that there are sizable differences in national effort even between countries which not only face similar constraints but also have made similar social choices. This means that political will may partly offset constraints. As far as education is concerned, this political will is nowhere more visible than in West Africa (and to a lesser degree in East Africa). But it, too, has its limits and cannot be expected to push the majority of those countries much further along the road of increasing national effort.

The need for cost-reducing measures and, more generally, for policies turned toward cost effectiveness is everywhere present and is becoming urgent in many countries. Because the cost of teachers is by far the largest item of total education cost, it is normal to look first at possible ways to reduce it.

CHAPTER 4

THE COST OF TEACHERS: FACTS AND PROBLEMS

The cost of teachers is often considered to be "high" in developing countries. But the adjective may mean several things. First, it may mean only that teacher salaries represent a high proportion of recurrent costs of education, whatever those costs may be. Second, it may mean that the wage bill for teachers represents a sizable proportion of the total recurrent budget and/or of GNP. Third, it may mean that individual teacher salaries are considered high compared with other incomes.

These observations may be made from a static point of view (today, in 1982, in country A, teachers' salaries are "high") or from a dynamic point of view (teachers' salaries are getting higher or are getting "too high"). Before using economic analysis, we will look at what we know about the facts of the case.

The Facts about Teacher Salaries in Developing Countries

Teacher Salaries as a Percentage of Current Expenditures

Table 4.1 based on Unesco data, shows us that teacher salaries represent globally between two-thirds and three-fourths of total current expenditures. If the percentage is lower in West Africa, it is because scholarships also represent a sizable proportion of the total in secondary and higher education. At the primary level, teachers salaries represent usually more than 90% of the total. [1]

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[1] The relatively low percentage for Asia is due to the presence of oil-producing countries and of Bangladesh, where welfare services are important.

Table 4.1: PERCENTAGE OF TEACHERS' SALARIES IN RECURRENT PUBLIC COSTS OF EDUCATION. AVERAGE BY REGION, 1978.

REGION/LEVEL	ALL LEVELS	PRIMARY
OECD countries	67.1	79.60
Latin America	76.7	92.90
Asia	69.4	82.60
Africa	69.2	93.20
West Africa	62.6	92.43
East Africa	74.5	95.06
"French" Africa a/	63.6	92.69

Source: Unesco *Statistical Yearbook* 1981, Tables 4.2 and 4.4.

a/ "French" Africa is defined as sub-Saharan Africa (countries which were colonized by France).

Although most of these data are not reliable if we want to draw conclusions about one particular country (see Part I), they are clear enough to allow us to conclude that in most countries the cost of primary education can be lowered only through a reduction of the teacher wage bill and that, at higher educational levels, this type of measure should also be very effective. But are these costs "too high"?

Teacher Salaries as a Percentage of GNP per Capita

Because Unesco data concerning expenditures on teacher salaries in secondary and higher education are difficult to interpret, the case for primary education will be used as an example. To have an idea of the relative salary levels in various regions and in individual countries within regions, average teacher salaries will be computed by dividing total salary expenditures by the number of primary school teachers, and the ratio of this average primary school teacher's salary to GNP per capita will be used. 2/

Around 1978, the average ratio by region was the following:

OECD countries	2.5
Latin America	2.4
Asia	2.6
Africa	6.7
West Africa	10.8
East Africa	5.5
Francophone Africa	11.5

2/ If one wanted to compare teachers' salaries with the incomes of equally qualified persons working in other sectors of the economy, it would be more appropriate to use the average incomes of graduates of the appropriate level of education. But these data are available for only some of the developing countries.

The contrast is striking between Africa and the other two regions. In Africa, the average primary teacher's salary is generally much higher than the average income of other economically active people. In Latin America and Asia, it is below that average income. Inside Africa, West Africa (and in that region, the former French colonies) stands out--salaries are twice as high in proportion to GNP per capita as in the rest of Africa and more than four times as high as in the other regions.

But individual country data, although they must be interpreted with great caution, seem to show important intraregional differences in the absolute levels of average salaries as well as in their relative levels (see Table A.3 of the Annex). What can economic analysis tell us about the determinants of the price of teachers?

"Economic Analysis of the "Price" of Teachers

In a market economy, the price of a given good is supposed to equal its marginal cost, given certain conditions. If that particular good is used as a factor of production, it is supposed to be paid its marginal value product. This price will be relatively high or low compared with the price of other factors according to the relative scarcity of the given factor. But teachers cannot be considered as commodities bought and sold in perfect markets. Their marginal productivity is difficult to ascertain for the following reasons.

- The products of their activity are multiform, partly competing, and often difficult to value in money terms.
- They are not homogeneous units of one same factor.

The supply of education generally does not originate in competing firms. In most countries education is largely controlled by the state, and most schools are public schools. Teachers, at least in public schools, are usually paid by the state or by local governments (which are usually subsidized by the central government). But this does not mean that salaries of teachers have nothing at all to do with productivity and with market conditions. The state cannot set up pay scales for teachers without taking into account economic conditions.

Salaries of teachers will depend on their relative scarcity, on alternative employment opportunities, and on their bargaining power. Relative scarcity depends on the supply and demand of qualified manpower. Other things being equal, when the number of graduates is low and the demand is high, teacher salaries will be relatively high. This type of situation is typical of the less advanced countries, which have to expand their school systems at a fast rate but which have few qualified teachers available.

Alternative employment opportunities also have an influence on supply and may reinforce the absolute scarcity of graduates. If graduates may get better pay and generally better jobs elsewhere, they will not take teaching positions. In developing countries, especially in Africa, the majority of job openings for graduates are in the public sector, where wage scales are often almost uniform from one service to the next. Nonwage compensation (vacation, subsidized lodging, and the like) will then be an important choice variable.

But competition may also come from outside the country. Richer neighboring countries may try to attract teachers by offering higher wages. This is particularly true in Francophone Africa, where teaching is still conducted in French in most cases and where the curriculum is still partly inspired by the French model. This situation favors the mobility of teachers and forces low-income countries to push the teacher wage scale above the "normal" level to retain local graduates. For instance, the relatively high salaries of primary school teachers in Upper Volta, Mali, and Niger can partly be explained by the influence of demand on the part of the Ivory Coast. But this problem is already much less acute in general because most countries are already trying to protect themselves from cheap foreign labor by closing their borders and because, in the case of the Ivory Coast, the proportion of native teachers in primary education is already close to 100% (99% in 1980).

Teachers' bargaining power is stronger when there is scarcity and still more so when the bargaining is led collectively through a strong union. Teacher unions are especially strong in West Africa. This may account, at least in part, for the fact that, in several West African countries, teachers earn more than other civil servants at the same level of qualification.

Economic analysis may therefore help us understand why teacher salaries are "high" and also why they are often not "too high" given the circumstances. 3/ But it may also help to understand better the effects of changes in pay scales on the evolution of the wage bill and to devise an economically optimal pay scale.

The optimal pay scale will be different according to the market situation. If there is no shortage of teachers, pay scales should increase with productivity. Assuming that productivity increases with experience,

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3/ This of course does not detract from the fact that a government that has to pay relatively high wages (in relation to national resources) may have more problems in financing its school system than others.

older teachers should earn more. And if the type of function relating productivity with experience can be observed empirically, it is easy to set up the optimal rate of increase. [4] If there is a shortage of teachers in some fields, it might be useful to introduce a "differentiated" salary scale to attract new candidates in the fields where scarcity is really a problem. But, of course, the psychological consequences of such a differentiation must be balanced against its advantages.

The future effects of changes in pay scales may be anticipated by using simulation models. These models allow us to compare the effects on total costs of various policies and of various mixes. They illustrate the fact that substantial savings may be obtained in the middle term by marginally changing the pay scale. [5] By applying economic analysis to the existing data, what policy recommendations can we make?

Policy Recommendations

Two remarks are in order before even attempting to point out possible ways to reduce the cost of teachers. First, the data show important interregional and intraregional differences, and a closer look at individual cases indicates that the relative importance of the various determinants differ in each case. Therefore, no attempt should be made to recommend uniform measures. There is no panacea for the ills of school systems; many high-cost countries are not responsible for these costs and in some cases could not lower them without endangering the future of education. Second, economically sound measures cannot always be implemented because of sociopolitical constraints. The economist can only point out the economic effects of a given policy to the decisionmaker, who should then decide according to the broader context.

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[4] This problem is addressed in a 1982 simulation model for forecasting teachers' salaries prepared by Manuel Zymelman (World Bank, Education Department).

[5] Many examples may be found in Zymelman's simulation model.

But, considering more specifically the context of sub-Saharan Africa, what can we say about the relative cost effectiveness of various cost-reducing measures? The objective is to reduce the total budgetary cost of teachers. It may be reached in different ways.

Lowering Unit Costs

This is the most direct and obvious way to reach the objective, but it can be considered legitimate only if teachers' salaries are considered as "too high." As long as a country faces a situation of high relative scarcity, and if that scarcity is not artificially created by restrictive practices on the part of teachers, the only solution is to pay high wages and to offer more openings in teacher training schools or their prerequisites (e.g., secondary schools).

With smoothly functioning markets, this policy should lead to a decrease in teachers' salaries within a few years. But in a situation where salaries are determined for all public servants simultaneously, this eventual future decrease will be much more difficult to implement. In most Francophone West African countries this is the case. But the extremely high level (in relative terms) of civil servants' salaries in that part of the world is a fact that cannot be explained only by relative scarcity and international supply and demand. It is, therefore, a major policy issue which will have to be faced by governments.

A more feasible alternative would probably be to revise pay scales of teachers to alleviate the future burden created by today's high recruitment rates. But this policy would have no immediate effect on costs.

The only effective measures would seem to be authoritarian measures--wage reductions, restrictions on migrations, compulsory orientation of students--which cannot be justified in general economic terms alone. But another way to reduce the wage bill, or at least to reduce its rate of growth, would be to hire less qualified persons.

Hiring Less Qualified Teachers

Most West African countries have resorted to this practice, although often mainly because qualified persons were not available. The saving on the wage bill from this practice may be quite important, as can be seen in the examples given in Table 4.2.

By hiring only people from the least qualified category, these countries may save from 40% to 75% of each individual starting salary, and the saving would increase through time if the new recruits were to stay in that category. The saving is still more important with temporary teachers, whose use allows the ministry of education to reduce new hirings considerably.

But effectiveness considerations have to be introduced here. If we assume that there is at least some correspondence between the relative pay scale of the different categories and their relative effectiveness as teachers, we have to conclude that such cost-reducing measures, if pushed to extremes, will also reduce the effectiveness of the schools.

The evidence on the determinants of teachers' effectiveness is not clear, and a discussion of it is outside the scope of this report. But, on the one hand, there is enough clear evidence about the low quality of schools in most sub-Saharan African countries (and even about a decrease in quality in the last decade) and also enough evidence about the low average effectiveness of totally unqualified teachers for governments to avoid using

Table 4.2: SALARY SCALES FOR PRIMARY SCHOOL TEACHERS WITH VARIOUS QUALIFICATIONS. SELECTED WEST AFRICAN COUNTRIES, MID-1970s.

COUNTRY	GRADE				
	I a/	II a/	III a/	IVa/	V b/
Benin	217 c/	118	105	100	49
C.A.R	424-948 d/	285-532	174-382	100-224	
P.R. Congo	279-589 d/	216-389	142-274	100-205	
Ivory Coast	197-422 d/	144-247	125-194	100-169	
Niger	220-570 d/	165-330	120-250	100-210	
Senegal	172-370 d/	117-212	100-187		
Togo	278-648 d/	204-389	100-248		

Source: Various Unesco reports.

a/ There are usually four categories of permanent teachers whose salaries increase with experience. These categories correspond to a given level of schooling, but this level differs from country to country. Some countries have only three categories.

b/ The fifth category is composed of temporary, nonqualified teachers, usually high school students who are compelled by law to teach for one or two years in lieu of military service.

c/ Average salary of the category; salary of the lowest "normal" category = 100.

d/ First figure for starting salary, last figure for finishing salary; starting salary of lowest "normal" category = 100.

this type of cost-reducing measure on a permanent basis. [6] On the other hand, it has been argued that the "highest-category" primary school teachers are overqualified in terms of length and level of training, at least in some countries in the region, and that the proportion of teachers of this category could be lowered where it is high by appropriate personnel management (e.g., one qualified headmaster plus two or three auxiliary teachers per school). But this type of measure can be applied only in countries where the proportion of fully qualified teachers is high.

Two other cost-reducing measures may have much less unfavorable influence on teachers' effectiveness: increasing teaching loads and increasing average class size.

Increasing Teaching Loads

To cover the whole curriculum, teachers have to be in contact with students for so many hours. If the compulsory number of hours each student has to teach is increased, fewer teachers will be needed for a given number of schools and of classes. Because public school teachers are usually well protected against being laid off, this type of measure will usually be more effective when enrollment is increasing, since it will enable governments to reduce the number of new teachers to be hired.

The feasibility of such a measure depends upon the initial teaching load and upon the bargaining strength of unions. There is at least one case where it was implemented in West Africa. This is in Benin, where the teaching load of secondary school teachers was increased as part of a package of cost-reducing measures that succeeded in maintaining the cost per student at a constant level in current prices after 1975.

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[6] For evidence on the quality decrease, see Heyneman (1981 and 1983). Of course, a progressive reduction in real wages may be obtained by raising salaries by a smaller percentage than the rise in the price level. This would have no immediate effect on quality, but in the middle term it would probably decrease it through mobility.

Increasing Average Class Size

This type of measure has been advocated by some, based on two arguments:

- Most studies show no significant influence of class size on internal effectiveness, and some even show a positive influence. 7/
- A moderate increase in class size would provide enough savings to finance important quality improvements. 8/

But a closer look at the data shows several things. First, all these studies were made in fairly developed countries, and very few observations concern classes of 50 pupils or more. But, if we look at the situation in primary education in West Africa, for instance, we observe that eight out of the twenty-two countries of the region for which data were available had an average class size of 50 or above in 1978. (See Table A.4 in the Annex). And it is well known that most urban classrooms are overcrowded, even in countries where the average is below that level. For instance, in Senegal in 1980-81, 1,463 classes out of 7,921 (18.5%) had more than 70 pupils, and numerous cases of classes with more than 90 pupils (with a maximum of over 150) are cited. At the same time, 380 classes (4.8%) had 10 pupils or less.

7/ For a survey of the evidence, see Haddad (1978)

8/ See the (cross-sectional) results for Chile (a 15% increase in class size would be associated with an annual savings equivalent to 5% of the annual budget in 1970) in Schiefelbein and Farrell (1974).

Second, class size seems to be fairly important in the first grades of primary education but not afterward. [9] In sub-Saharan Africa, and especially in Francophone countries, repetition rates and dropout rates are generally high, and teachers often prefer to teach in the upper grades. The result is that the average number of pupils per classroom is much higher in the first grades than in the following ones. For instance, in Mali in 1978-79 the situation was the following for grades in public primary schools:

	Pupils per class
1st grade	62
2nd grade	54
3rd grade	49
4th grade	41
5th grade	36
6th grade	30

In Senegal in 1980-81, 1,041 out of the 1,463 classes with more than 70 pupils per class were in the three first grades.

This evidence shows that, at least in the first grades of primary education, the pupil-teacher ratio is already very high, that a decrease of that ratio would probably improve internal efficiency, and that an increase in it would probably still worsen the present unsatisfactory state of things. Furthermore, it may be physically impossible to put more pupils in already overcrowded classrooms. If one had to build new and larger classrooms to accommodate the larger groups, the result would probably be highly cost ineffective. But the introduction of double-shift scheduling where it does not yet exist could probably help solve this problem if teachers were trained for multigrade teaching.

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[9] See Balow (1969).

Increasing the pupil-teacher ratio might be more effective in secondary and higher education, but the evidence from West Africa shows more cases of overcrowding than of undercrowding, which leads us to believe that such a cost-reducing meausure can be cost effective only in a very few cases. To reduce the cost of teachers, another type of measure is theoretically possible: to modify the production function of education in such a way that it becomes less labor intensive.

Replacing Teachers by Other Factors of Production

The so-called communication revolution has raised high hopes in education. For centuries the education production function had been highly labor intensive. Knowledge and know-how were transmitted by a teacher to a group of pupils through face-to-face contact. But, because teachers are usually part of the highly qualified manpower, they constitute a scarce resource and are therefore rather expensive. As soon as distance communication became easy, projects to replace face-to-face teaching by transmission through the media of the "educational message" were studied and implemented.

So great was the belief in the high cost effectiveness of distance teaching compared with traditional schooling that, at first, no evaluation was deemed necessary. But the heavy investments involved in this type of project made financiers, in particular donor agencies, more cautious. As a consequence, cost-benefit and cost-effectiveness studies of all the main projects were undertaken. The amount of evidence is now sufficient to draw certain tentative conclusions. 10/

- The use of new educational media (radio, television, computers, etc.) in regular schools is generally not cost effective, at least at the primary level. It has not been used to change the normal pupil-teacher ratio and therefore adds to the cost and does not significantly improve effectiveness except in a few, especially and carefully designed projects at the secondary level.
- Distance teaching through the media does not altogether dispense with teachers. Only when the project is well designed and caters to an extremely motivated group is it cost effective.
- Basic education cannot be effective without important face-to-face contacts with a teacher. Teachers do have to be specially trained to make effective use of the new techniques. It is therefore illusory to believe that the total cost of primary education could be lowered by distance techniques alone.
- Distance teaching might be the only way to reach certain groups who do not frequent regular schools (for instance, the children of nomadic groups living in thinly populated areas). It might be more cost effective than trying to set up regular schools for those groups, but it will be more expensive than the average regular school.

10/ We are giving here only an extremely brief summary of the main conclusions of a comprehensive survey of the evidence. For more details, we refer the reader to Eicher and others (1982).

- "Little media" are more cost effective than "big media" [11/] although the microcomputer may change this situation in the future.
- Modern technology cannot be effective in education if a minimum number of qualified technicians is not present to maintain the equipment, and this minimum number is not always available in developing countries.

In conclusion, poor countries will find it difficult in many cases to lower the cost of teachers, and they should resist using cost-reducing measures of the type most likely to reduce the quality of teaching.

But, because teachers represent by far the largest part of total education cost, especially in primary education, even marginal changes may be quite effective. Ingenuity will have to be applied to find the optimal mix of cost-reducing measures, and a strong political will be needed to make the common good prevail. In some countries, the potential cost saving is more than marginal. But these savings should in many cases be transferred to the "other current expenditures" line of the budget, since quantity and quality of the teaching aids is often dramatically low.

11/ These terms were coined by W. Schramm. "Little" media like radio are those which do not necessitate heavy investment. Opposed to these are the "big" media like television. See Schramm (1977).

CHAPTER 5

COST EFFECTIVENESS OF QUALITY-IMPROVEMENT MEASURES

Although most developing countries face severe financial constraints and are looking for cost-reducing policies in education, they are aware of the relatively low quality of their schools and that some cost-saving measures may push this quality still further down. Yet they might be willing to improve the quality of education if it could be proved to them that some measures are both inexpensive to implement and very effective.

After a brief survey of the different factors contributing to quality (or the lack of it) of schools, the facts will be examined to ascertain whether, and to what extent, there is an urgent quality problem in some or more countries. Then the chapter will concentrate on the analysis of the relationship betwen student achievement and school characteristics before attempting to draw some policy conclusions.

Determinants of School "Quality"

In any productive process, the quality of the output depends upon that of the inputs. The "output" of schools is students. The students as outputs differ from the students who entered the schools as "inputs" by what "value" was "added" to them. This value has many dimensions whose relative importance will vary according to the hierarchy of social objectives given to the schools and according to the relative efficiency the schools manifest in the pursuit of each objective.

Because it is not our purpose to make a choice among various philosophies of education, and inasmuch as the amount of new knowledge the pupils have acquired in the various fields of the curriculum is always considered and important dimension of the "output," we shall satisfy ourselves with such a unidimensional measure. [1]

The main inputs to be considered are:

- Teachers
- Classroom resources
- School plant
- School management.

These inputs are complementary, but that does not mean that the relative effect of improving their respective quality may not be different. They should therefore be considered separately. [2]

Evidence on School Quality in Developing Countries

Quality may be observed by using monetary indices, such as expenditure per student, or physical indices, such as number of square meters per student, quantity of various resource (books, desks, maps) per student or per classroom, student-teacher ratio, number of students per classroom, and so on.

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[1] This is not to say that a homogeneous conceptual framework is not essential to a proper analysis of production functions. But, if one can agree with H. Levin (1980) that there is a conspicuous absence of such a framework in most empirical work in this field, one also may agree that there are good reasons for it, with the underlying complexity of the phenomenon as the main one. As shall be seen later, the relevance of what is learned is still more important than the amount of knowledge acquired.

[2] A more rigorous analysis would further subdivide these inputs. It would especially distinguish at least three determinants of teacher quality: capacity (of which level of qualification is only one dimension), effort, and time. These issues are important, and Levin is right to point them out and to start analyzing them (Levin 1980, pp. 207-85). But in this paper we are concentrating on what is generally accepted, at the risk of being often hopelessly superficial.

Monetary Indices

These are generally very unreliable (as was shown in Part I) when they are drawn from macro statistics. This is mainly because current expenditures other than salaries are not always registered in detail in central budgets, they are often incurred at the regional level and are not always included in national data, and a sizable part of them are financed by local communities and by the families of the pupils. Specific surveys would be necessary to bring out the complete picture, but very few are available. The contributions by village communities and by parents will be examined more fully in Part III. Here, we will only briefly comment on what can be gotten from the existing monetary indices about the quality of three of the four main inputs.

Teachers. As was seen in Chapter 4, absolute salaries cannot be used as an index of quality because they are strongly correlated with the level of national income. Teachers' salaries as a percentage of GNP are a little better indicator, but they are partly determined by supply and demand factors and by the institutional background. For instance, when one looks at teachers' qualifications one cannot interpret the relatively high salaries of primary school teachers in Francophone Africa as reflecting only their relatively high quality (compared with teachers in other regions.) The data presented in Chapter 4 therefore have to be interpreted with care.

Classroom resources. The amount spent on school supplies and light equipment is poorly recorded in national data. But evidence from a few special surveys [3/] confirms that in most low-income countries the amount

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[3/] Heyneman has given evidence on four developing countries (Bolivia, El Salvador, Indonesia, and Malawi) in recent World Bank reports; see Heyneman (1983).

spent per pupil in primary schools is below US$2 per year. There is also evidence that this amount has had a tendency to decline in many countries in the last ten to fifteen years. For instance, in Mali the official budgetary data showed a budgeted expenditure of 285 million CFAF in 1966 for scholastic supplies at the primary level. In 1972 that figure had gone down to 190 million CFAF and in 1976 to 120 million CFAF.

Buildings. There are unfortunately no comparative figures on cost per square meter in different countries; even if there were, these data would have to be deflated by the price level. But data available in a few countries on differences in cost per classroom according to the type of construction and the region may be of some interest.

From the above, one must therefore conclude that monetary indices are on the whole of little value for comparative analyses.

Physical Indices

There are no general physical indices available except in a very few countries. But local surveys show that:

- In many developing countries, the quality of school buildings is so low that it often impedes the learning process, especially at the primary level, because "wind and rain disrupt classroom activity as a matter of course" (Heyneman 1981).
- The quantity and quality of furniture and supplies is generally insufficient--only in rare cases does one find one textbook per pupil in primary educaton; many schools do not offer enough seats and desks; teacher aids are often hopelessly inadequate.
- The proportion of unqualified teachers is often very high (see Chapter 4). Table A.5 in the Annex summarizes the information

available for West African countries. It shows that the situation is generally not very promising except in the Ivory Coast and, to some extent, in Senegal.

The Relation between School Characteristics and Student Achievement

Does the quality of school inputs have a significant influence on the educational achievement of students? If so, what are the input improvements which are the most cost effective? Is there a possibility of improving attainments significantly while staying within very strict budgetary constraints?

The Overall View

A tremendous amount of research has been directed in the last fifteen years or so toward answering this question. The evidence which was gathered during the late 1960s and the early 1970s seemed to point overwhelmingly in the same direction and to warrant pessimistic conclusions. Not only did it appear that school resources (as measured by per pupil expenditures and level of teacher training) did not seem to have any significant effect on student scholastic achievement, but quality improvements also seemed to benefit more socially privileged students than their less affluent comrades. 4/ But these conclusions have been challenged in the last five or six years.

4/ The most influential studies in this field were the Coleman report (1966), the Plowden report (Central Advisory Council for Education 1967), and Jencks' book on inequality (1972). But many other more limited surveys seemed to point in the same direction.

First, studies using a broad array of school quality variables tend to show that schools do affect educational outcomes [5] and that they may benefit more underprivileged children. But the studies also show that expenditures and teacher certification are not the most significant variables--educational climate and school organization are often more effective. Second, analyses of data concerning developing countries tend to show that school variables are much more important as predictors of educational outcome in poor rather than in rich countries, although the variables which have the strongest effect differ from one country to another and according to the outcome observed.

For instance, a comparative study made by Heyneman and Loxley (1983a; 1983b) of the situation in twenty-nine countries gives the following results:

- The proportion of explained variance in academic achievement that is attributed to variables of school and teacher quality in a model--including preschool influences (age, sex, and socioeconomic status) and school variables (program, teacher, quality of school and of teachers measured by various indices)--is on average 66% in the fifteen developing countries included in the survey (Argentina, Bolivia, Botswana, Brazil, Chile, Columbia, Egypt, El Salvador, India, Iran, Mexico, Paraguay, Peru, Thailand, Uganda). In the remaining fourteen developed countries, this percentage is only 35%.

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[5] For a survey of recent research in the United States, see Dougherty (1981). For sub-Saharan Africa, a survey giving more mixed evidence can be found in Assie (1982).

- Preschool variables (which were introduced first in the regression) accounted for 56% of the explained variance in developed countries but for only 33% in developing countries.
- There is a highly significant negative correlation between the influence of school and teacher quality variables on educational achievement and level of per capita GNP ($r = -.72$; $p \leq .001$), which suggests that "the poorer the country, the greater the impact of school and teacher quality on science achievement" (Heyneman and Loxley, 1983a, p. 19)

But, before drawing definite conclusions from this study, one should note the following.

First, the authors have gathered all the comparable data sets available. But other studies show a contrasting picture, especially concerning the differential effect of schools on pupils of different social origins (Assie 1982).

Second, the authors themselves admit that, although they consider that they have improved upon past studies, there are still methodological problems which may reduce the validity of the results.

Third, total variance explained is in many cases quite low (for developing countries, it is below 20% in five cases, between 20% and 30% in five other cases, and is nowhere above 40%), which means that the proportion of total variance explained by school and teacher quality is not above 20% in eleven cases out of fourteen and is around 25% in the other three. All in all, on average the percentage of total variance explained by school and teacher quality variables is not very different in the two groups of countries (the median is 15% in the developing group and 11.5% in the developed group).

Fourth, among the developing countries included in the sample, the correlation between the level of GNP per capita and the proportion of explained variance attributable to school quality variables is weak.

Fifth, and most important, the achievement tests used to represent quality of schools and teachers and which qualified for the final regressions vary from country to country.

This procedure raises several serious questions.

- For each country in the sample, quality variables are introduced and observed as a block. On the one hand, this prevents showing the relative importance of equipment vs. teacher quality. [6] On the other hand, the original variables selected to represent teacher quality are so heterogeneous that it is sometimes difficult to see the rationale behind the choice. For instance, why select indices of social origin and of standard of living to characterize teacher quality in some cases and not in others? Obviously, there is a different theory of the educational process implicit in each choice, and the term "quality" does not always mean the same things.

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[6] Further analysis of the data could, of course, bring this out.

- From a comparative point of view, the procedure for selecting the variables used in the final regression lowers the comparability of the results; some variables disappear in some countries' equations, others in other equations, so that we are left with different indices of quality in different countries. For instance, in the eighteen-country International Association for the Evaluation of Educational Achievement (IEA) Science Survey, no single objective index of teacher quality is present in the final regression for more than six countries. "Subjective" indices trying to represent teachers' attitudes toward their work are a little more homogeneous, but the same index is never present for more than seven countries. In many cases, only two or three countries share the same index. As a result, detailed cross-sectional analysis is most of the time impossible. This is a pity because comparisons between the relative effectiveness of various quality improvement measures are made hazardous.

In spite of their scientific quality, these comparative studies therefore leave us with two questions. First, they give strong evidence in favor of relatively stronger influence of school variables (and, correlatively, of a relatively weaker influence of preschool variables, especially home background) in developing countries. But they evidently do not explain why this happens. In other words, the first question is: Are there any logical reasons to expect such a difference?

Heyneman and Loxley (1983a, pp. 14-18) do not find any convincing evidence pointing toward a lack of variance in socioeconomic status of students in low-income countries, toward a high preselectivity of pupils with low socioeconomic status, or toward a high correlation between social origin of the students and "quality" of the school. They conclude that the explanation of the relative lack of influence of family background variables on achievement in low-income countries may therefore be found in "a more uniform aspiration among high- and low-income families to utilize education for social mobility" (p. 21).

This hypothesis sounds plausible, but no direct evidence is given to sustain it (perhaps because the evidence on social selectivity of schools, at least in Africa, is too mixed to warrant definite conclusions; see Assie 1982). The two results which look fairly well established--that school quality variables have a relatively stronger influence than preschool variables on school achievement, on the one hand, and that in most developing countries there is a much better chance for children of socially privileged groups to stay in school, on the other hand--are fairly difficult to reconcile. Two conclusions then seem warranted: that stronger theoretical bases are now needed if we want to understand better the determinants of educational outcomes, and that developing regions are too different from one another for conclusions lumping them all together to be very useful.

The second question we are left with is one which concerns us more directly here. Granting that school and teacher quality variables do generally have more influence on educational outcomes in poor countries, which are the quality-improvement measures that are both cost effective and inexpensive enough not to be barred by budget constraints?

Evidence on Relative Cost and Cost Effectiveness of Different Inputs and Its Interpretation

The evidence to be gathered from available studies is scant and often unreliable, for three reasons. First, cross-sectional analysis cannot go very far into detail in the analysis of the influence of a specific input because, as we have seen, the different studies which are being compared were not designed in the same way. One therefore has to fall back on broad aggregates, such as teacher quality, which are made up by putting together what are in fact different variables (teacher salary in country A, teacher educational level in country B, teacher certification level in country C, teacher attitude toward work in country D, and so on).

Second, even analysis at the country level is difficult because most studies were not designed to give cost-effectiveness information. Quality variables most of the time either are not measured in units which can be costed (for instance, it is asked whether the Parent-Teacher Association, or PTA, is active, and not how much money it spends on school; whether the school gives free materials to students, and are not what amount) or are not susceptible at all to cost measurements (attitude variables, for instance).

Third, cross-sectional analysis always leaves the suspicion that "all other things" are not really being equal, and the inequality may explain at least part of the observed differences in achievement.

In spite of these severe shortcomings, existing studies do give us a certain amount of information. But there is room for more and better-tailored research in this area.

Evidence from Existing Research

This section will examine existing research findings on student achievement and three main education inputs: teachers, physical facilities, and school management.

Teachers. Several points are apparent from available research.

- Level of education of teachers does not seem to have a powerful effect on student achievement. This effect is generally positive but small (and often not significant in the regressions) at the primary level, but it disappears or becomes negative at the secondary level. [7] But one must note that only one study concerns sub-Saharan Africa and none West Africa. One significant result of the study on Uganda (Heyneman 1976), however, is that the only characteristic of primary school teachers which was found to be significantly related to student achievement was "English language competence." This aspect of teacher training is essential in all those countries where the language used in the school is not the language used in the home and concerns, therefore, most of sub-Saharan Africa. More than the level of general education, ability to teach in the language used in the school system should be emphasized in recruitment.

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[7] Schiefelbein and Farrel (1974); Loxley and Heyneman (1981); for a more general survey of the evidence, see Avalos and Haddad 1979.

o It is difficult to disentangle level of teacher education, certification, and training. Therefore, it is also difficult to decide which characteristic is more important for policy emphasis.

o Attitudinal variables (and, more generally, teacher characteristics which cannot be easily manipulated by policy) seem to be more important than level of teacher education and/or of training.

On the whole, it seems safe to draw three conclusions from the existing research on teachers. First, education and/or training above a minimum level generally considered as indispensable to teach properly does not seem to improve educational outcomes significantly. Second, research design in this field has progressed a great deal in the last ten years, but few of the available sample surveys made in developing countries have been properly designed to give reliable answers to the questions raised above. (Because local conditions differ widely from country to country and from region to region, no general conclusion should be drawn from existing evidence, and new research should be encouraged in countries where reforms are envisaged. Third, teachers do not teach in a vacuum. Their effectiveness depends partly upon the quantity and the quality of the teaching aids at their disposal and upon the size and the quality of the school building.

Physical facilities. Keeping in mind the caveats expressed above about the possibility of drawing general conclusions from the comparison of studies which do not include the same variables and were not designed in the same way, some tentative conclusions may be presented.

o When school quality variables are entered as a block in regressions, their combined effect is always positive and statistically significant and is most of the time the principal determinant of explained variance of educational achievement.

o Several recent studies seem to bring evidence in favor of a stronger influence of school quality variables on educational achievement of children from a disadvantaged home environment.[8] This evidence is still too fragmentary, and it comes from studies which were not designed to test this specific relation, so that the question is still open. But at least it is contrary to the idea that privileged children benefit more from quality improvements than do their more disadvantaged schoolmates, and this in itself is worth noting.

Although the evidence is often difficult to interpret,[9] three conclusions seem to emerge from the analysis of the influence of specific items. First, class size, up to a certain level, has no significant effect (and sometimes even a negative effect) on student achievement. [10]

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[8] See Birdsall (1982a) on Brazil; Heyneman, Jamison and Montenegro (forthcoming) on the Philippines; Loxley (1983) on Egypt. For more ambiguous results, see Heyneman and Jamison (1980) on Uganda; Schiefelbein and Farrell (1974); Loxley and Heyneman on El Salvador (1981); Prewitt (1974) on Kenya.

[9] Loxley and Heyneman (1981) provide a good example of a "paradoxical" result concerning two-seat desks in El Salvador.

Second, the item which comes out consistently with the strongest positive effect is books. School library size, library use, and number of books in the home are always positively correlated with achievement, but availability of textbooks is unquestionably the single most effective quality item. [11] It is almost impossible to use existing data to make cost-effectiveness comparisons. But the little we have seems to point toward higher cost-effectiveness for textbooks than for any other school facility. For instance, in El Salvador it appears that an increase in expenditure on textbooks of 1.5 colones ($0.6) per pupil is linked with an increase in achievement of 1 point (the mean score being 50). The same difference in achievement is linked with a difference of 0.26 years of teacher education. Although no direct monetary measure of this last item is available, it is clear that it amounts to much more than 1.5 colones per pupil. [12] Studies on textbook production, however, show that, given certain conditions, the cost of improvement can be assumed directly by poor countries at a low cost per student. [13]

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[10] For a more thorough discussion, see Chapter 4. Schiefelbein and Farrell (1974) discuss the ambiguity of this concept.

[11] For a synopsis of the literature on the influence of reading material on student outcomes in low-income countries, see Heyneman (1981).

[12] Of course, these conclusions have to be interpreted with the utmost caution. First, they are valid only if we feel allowed to use directly the absolute value of the beta coefficient for each variable, and in any case they only show that given differences in inputs between schools are associated with given differences in outcomes--not that a given increase in one input in one school would result in the same given outcome.

Third, new educational media (radio, television, computers, and the like) are sometimes very effective but never cost effective in the context of the traditional school. Their extensive use can therefore be envisaged only as part of a sweeping educational reform or in out-of-school education programs. [14] Whatever the possible conclusions for individual inputs, one should not forget to look at the way in which the various school inputs are combined.

School management. In a firm, productivity depends not only on the quality of the various inputs but also on the way in which they are combined and, more generally, on the quality of management. Schools are like firms in that they have to combine various inputs to produce education.

- Concretely, one should expect the quality of education provided in a given school to be affected by the ability of the school principal to raise local resources (when he or she is free to do so) and to use them for improving the quality of physical facilities by his (or her) ability to organize the time schedule of the various streams, to develop the enthusiasm of teachers and of students, and so on.

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[13] For a persuasive presentation of this question, see Neumann (1980).

[14] References to extensive studies are given above in Chapter 4.

o A few recent studies of the determinants of student achievement include items concerning various aspects of school management and/or various characteristics of school principals. Although the conclusions one may draw from them are still very tentative, it appears that management is important and that the role of the principal may be decisive if he or she is given good training and sufficient autonomy. [15]

Three conclusions therefore seem to be allowed by this review of the existing evidence. First, although the optimal input mix strongly depends upon the local situation, in all cases where there is a shortage of textbooks, improving their availability and their relevance is almost certainly the most cost-effective quality improvement measure and a relatively cheap one if textbook production and diffusion are carefully designed.

Second, teacher characteristics do not seem to be very important, other things being equal, as long as teachers have a minimum of education and of training. Furthermore, those characteristics which seem to be the most effective (home environment, attitude towards students, attitude toward work, etc.) are not those which can beaffected by policy.

15/ The clearest case seems to be that of Indonesia, where about half of the influence of school and teacher quality on student achievement in the 12th grade seems to be attributable to the level of the principal's salary (1982 World Bank data on Indonesia compiled by S. Heyneman, Education Department). Preliminary results of a study of achievement in the 6th grade in Peru (1982 World Bank data compiled by A. M. Arriagada, Education Department) go in the same direction. School variables account for more than half of explained variance in reading and in science, and around half (46% in reading, 57% in science) of this influence is due to management.

Third, management of the school is an important variable. Improvement of management through better training and higher salaries of principals appears to be relatively cheap and cost effective. But these conclusions need to be strengthened and complemented through further and better-adapted research.

Proposals for Further Research

As already stated above, more studies should be undertaken before several key questions about the cost effectivenss of various school inputs can be answered with a reasonable degree of certainty. But to be more effective, future studies should go in three directions.

- First, although each individual study has to be designed according to the local situation to be explored, they all should attempt to include (and to define in the same way) the same key variables. For instance, they should all include the level of education of the teachers, measured in the same way; they should all include a question on the availability of textbooks; they should all include questions about the level of training of the school principal.
- Second, all education projects sponsored by the World Bank which aim to improve school facilities should include an evaluation of the impact of these improved facilities on student achievement.[16] More attention than in the past should be given by Bank staff members to the design and the execution of such research studies.

16/ That this is not yet the case is shown by the fact that, in West Africa for example, out of half a dozen projects of this type only one (in the Central African Republic) specifically mentions such an evaluation.

- Third, to strengthen the tentative conclusions drawn from cross-sectional analysis, more longitudinal studies observing the effects of innovations in given schools should be undertaken.

CHAPTER 6

THE TREND IN UNIT COSTS

One of the most salient characteristics of modern economic growth since the beginning of the nineteenth century is the almost universal increase in the size of producing units. Economic theory teaches us that this phenomenon was caused by the fact that technical progress was mostly labor saving, so that firms reaped "economies of scale" by growing up.

One could be tempted to draw a parallel between industrial growth and the rapid expansion of school systems in developing countries and to predict that unit costs of education should go down as long as this expansion is not over. But this tendency for unit costs to decrease as productive capacity increases has its limits and its constraints. The evidence therefore has not only to be examined with a critical eye but must be interpreted and supplemented by the use of pertinent economic analysis.

The Statistical Evidence: A Critical View

Economies of scale are usually observed through the behavior of unit costs when the level of production changes. But education is a peculiar industry, and its study needs special statistical indices.

What Kind of Statistics Are Needed?

In a firm, unit cost generally means cost per unit of output. But schools do not turn out units of material goods. They perform various services which, as we have already recalled, are partly competitive. It would therefore be hopeless to try to define in a nonarbitrary way the output of education and to attempt to measure it in a unique way.

An analysis of the objectives pursued by schools may, however, avoid this apparent dead end. Schools, as a matter of fact, are always (and essentialy, at least at levels below higher education) meant to have students and to offer them certain services. Rates of enrollment are universally used as indices of the level of "production" of the school systems. To be able to provide classroom space to all the children reaching school age is a goal of all countries.

The student is therefore the most relevant unit to use when measuring unit costs of education. To observe decreasing cost per student as the number of students increases means that it will be easier and easier to reach a given educational target as that target becomes closer. Total cost per student is apparently the best index to use because it gives an evaluation of the amount spent. But recurrent cost per student may also be useful to observe--especially in developing countries, which usually can more easily find outside sources to finance investments than to cover day-to-day expenditures of schools.

But, as we have seen in Chapter 3, budget constraints tend to make governments reason in terms of the maximum "effort" they can afford. The essential question for them is therefore whether the effort they make to bring another child to school may be expected to decrease in the future. This effort is usually measured by dividing unit cost by per capita GNP. But we want to compare unit cost at various levels of output. In the case of education, the obvious variable to examine is the number of students enrolled, and it might also be interesting to use a relative rather than an absolute figure. The rate of enrollment would then be chosen.

The comparisons should logically be made for the same country through time. But time series are often difficult to get for a long time span. Cross-sectional analysis may be used if there are enough good reasons to assume that the differences in unit costs between countries at a given point in time are mainly due to the differences in the level of "output."

But, as we have seen, cost per student to the state depends upon the institutional setting. The use of the ratio of unit cost to per capita GNP eliminates most of the influence of the level of development but does not account for this factor. This is why we feel that comparisons should be made only between countries belonging to the same "region" -- that is, to a group of countries sharing certain institutional characteristics.

A Survey of Statistical Evidence

Cost per student varies with the level of education one considers. Average cost for all levels depends upon the enrollment pyramid. It is therefore more useful to examine unit costs at each level. For reasons already mentioned, we shall limit ourselves to higher education and to primary education.

Time series and higher education. In a study made in 1980, G. Psacharopoulos presented evidence which led him to conclude: "In spite of cost fluctuations in the case of a few countries, the clear picture that emerges is that of a falling cost per student in constant prices" (Psacharopoulos 1980, p. 29). A closer look at the evidence he presents, as well as the observation of other data, challenges that conclusion.

o Of the seven developing countries for which Psacharopoulos gives data, three (Egypt, Thailand, Mexico) do not exhibit falling costs per student in constant terms, and one of those three (Mexico) shows sharply rising costs when one extends the series from 1975 to 1978. Another country (Pakistan) should not exhibit falling costs but slightly rising ones, according to Table B.8 in Psacharopoulos's Annex. The data for two other countries (Ghana and Zambia) do not seem to coincide with the reference; Unesco data show a stabilization since 1970 (Ghana) or marked increase between 1975 and 1978 (Zambia). The series for the only developed country (France) starts in 1964, the year when cost per student reached a historical peak. A longer series starting in 1952 shows the real unit cost index to rise from 28 to 100 between 1952 and 1964, at a time when enrollment was increasing very fast, before falling back to 69 in 1978.

o Data for developed countries in 1970 and 1978 show quite a mixed picture, as can be seen in Table 6.1. Between 1970 and 1978, six of eleven countries exhibit a (more of less marked) downward trend, three an upward trend, and two no marked trend. But the trend before 1975 is clearly upward, since only two countries (France and Norway) show decreasing costs, and it is reversed in the second part of the 1980s (only one country, France, shows a slight upward trend). We have here the first indication of possible changes in policy as the main determinant of cost per student. 1/

1/ A comparison of the average amount spent per student as a percentage of GNP per capita made by M. Zymelman (1982 World Bank data, Education Department) tends to confirm this change of policy; it shows that this index of effort has gone down between the early and late 1970s.

o Data for various countries situated in sub-Saharan Africa show no uniform pattern for higher education, as can be seen in Table A.6 of the Annex. But one can see that there is a jump in unit cost when a national university is created where only scattered higher education streams existed before. After a university has been created, the trend is apparently downward.

Table 6.1: EVOLUTION OF EXPENDITURES FOR HIGHER EDUCATION PER STUDENT IN 1978 PRICES. SELECTED DEVELOPED COUNTRIES, 1970-78.

	YEAR			TREND a/		
COUNTRY	1970	1975	1978	1970-75	1975-78	1970-78
Belgium	105,572	154,208	151,220	+	=	+
Denmark	35,818	36,720	28,670	+	-	-
France	10,680	8,078	8,910	-	+	-
Italy	824,362	1,067,826	842,400	-	+	=
Netherlands	12,320	17,718	17,350	+	=	+
New Zealand	12,320	2,470	2,340	+	-	+
Norway	23,031	21,530	20,690	-	-	-
Sweden	16,716	19,638	15,910	+	-	=
Switzerland	14,209	16,350	11,210	+	-	-
U.K.	2,592	2,656	1,890	=	-	-
U.S.A.	3,259	3,191	2,930	=	-	-

Note: All figures in units of local currency.

Sources: Total expenditures in current money and enrollments:
Unesco Statistical Yearbook 1981, Tables 4.3 and 3.11.
Price indices: United Nations Statistical Yearbook 1979/1980, Table 168.

a/ Trends: + (increase of more than 3%)
- (decrease of more than 3%)
= (change less than 3%).

Time series and primary education. The dominant tendency between 1970 and 1978 in sub-Saharan Africa is upward, as shown in Table A.7 of the Annex. The evidence from time series is therefore not clear. If anything, it points rather toward rising unit costs, at least until the budgetary squeeze of the middle 1970s.

Cross-sectional evidence and higher education. G. Psacharopoulos gives evidence for fifty-eight non-oil-producing developing countries as well as for eighteen developed countries and seven oil-producing countries around 1975 (Psacharopoulos 1980, Section IV).

Three conclusions may be drawn from these data. First, there seems to be a clear negative relationship between the cost per student and enrollment in higher education and a still clearer one between what Psacharopoulos calls the "real" cost per student (cost per student divided by per capita income) and the enrollment rate. Second, the shape of the function seems to be hyperbolic, thereby implying a sharp decrease of cost per student when enrollment starts rising and fewer gains thereafter (when enrollment ratios go above 5%). Third, the scatter diagrams also show extraordinary differences in cost per student among poor countries with a very low enrollment rate in higher education.

These findings, therefore, seem to point to the possible existence of economies of scale. The fact that they conflict with time series, however, must make one very careful in drawing conclusions from them. As shall be seen below, economic analysis should be pursued further, and better data gathered, before asserting the existence of economies of scale. Nevertheless, the cross-country differences in costs, given the level of enrollment, provide further proof of the importance of the policy variable.

Cross-sectional evidence and primary education. A simple linear correlation model applied to sub-Saharan Africa using "real" cost (defined by G. Psacharopoulos as the dependent variable and net enrollment ratios) as the independent variable shows a highly significant negative correlation between the two variables. The results are the following for 1978:

31 sub-Saharan countries	$r = -0.47$ ($p = 0.004$)
28 sub-Saharan countries whose data are more reliable	$r = -0.53$ ($p = 0.002$)
10 West African Francophone countries	$r = -0.79$ ($p = 0.006$)
18 other sub-Saharan countries	$r = -0.24$ ($p = 0.171$)

Only in the last case is the coefficient nonsignificant at the 1% level. But this finding again contradicts the evidence from the time series as far as economies of scale are concerned. Some reflection about the meaning and the limits of the economic theory of economies of scales is therefore in order.

Lessons from Economic Theory

The concept of economies of scale was developed within the theory of the firm. It is part of the more general law of variable proportions, which is meant to explain the familiar U-shaped average cost curves one finds in economics texts.

The idea behind this is indeed quite simple and may be summarized in the following way. The factors of production which are combined to produce a given good or service cannot all be divided into very small units. It follows that, if one wants to produce at all, one has to purchase a minimum amount of each factor, and that this minimum amount is, in the case of some factors, "too large" if the firm turns out only a few units of the output. One says that the productive capacity of the input(s) which can be acquired only in large lumps is "underutilized." The building in which production takes place is one of the cases in point.

But it also follows that one can increase production, within certain limits, without having to purchase more of the "lumpy" factor, so that average cost per unit of output decreases when production increases (other things equal). In other words, one experiences economies of scale. But it is clear that this reasoning applies only at the microeconomic level to one given productive unit. It only goes to say that, given the state of the techniques, there is an optimal size to the productive unit and an optimal size of operation of a given unit where capacity is fully utilized and average cost at a minimum.

This conclusion cannot be directly extended at the macroeconomic level, however, because total production can usually be increased by setting up another productive unit in which unit costs are the same as the unit cost in already active units. In the field of education, the productive unit is the school. It is easy to see why cost per student should decrease in a given school when the size of the school increases, at least up to a certain point. The most obvious reason why this is so is that teachers' salaries are always the largest input cost. Because teachers can effectively teach groups of students, cost per student has to go down from its initial high level when the number of student's becomes larger than one.

Another reason to anticipate economies of scale in education is that it is cheaper to provide certain services such as science laboratories or sports facilities to different groups of students than to one single group or class. But this already shows that economies of scale cannot be automatically expected when the school system expands. The optimal size of a school actually depends upon the level of education and its content. For instance, a science laboratory or industrial workshops may be deemed indispensable in technical high schools but not in primary schools. It also depends upon the level of the budget. It is cheaper per student to build adequate sports facilities for a large school than for a small one, but, if the ministry of education and/or local government cannot afford to provide schools with swimming pools or football fields, the optimal size might be smaller. [2]

At the macro or national level, the problem is still more complicated because it is theoretically possible to duplicate existing school facilities and therefore to expand the system at constant unit costs. But if we look at the problem of economies of scale from the point of view of poor countries where enrollment rates are still low, even at the primary level, what can we logically [3] say about the probable trend in unit costs when the school system expands? Let us consider each level in turn.

Primary Education

The expansion takes place essentially through the building of more schools and the training of more teachers. What types of economies of scale may be expected?

Larger school buildings. First, it is not obvious that larger school buildings are always more cost effective. But even though it may be the case, the practical possibility of building larger schools is very limited, especially in West Africa, for the following reasons. First, in urban areas enrollment rates are already high, and few new buildings are needed, except to reduce overcrowding. Building new and better schools would improve quality but probably would not reduce unit cost unless other cost-reducing measures, such as double shifts, were simultaneously put into operation. Second, in rural areas population density is usually low. In many cases, it is difficult to have more than one classroom where all grades are taught together. Larger school buildings, as well as modern facilities, are therefore out of the question because schools are usually built by villagers themselves through self-help schemes.

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[2] A recent article by Lawrence Kenny (1982) gives a good survey of the research on economies of scale at the school level in the United States and gives evidence in favor of sizable economies. But it is easy to see that these results cannot be extended to developing countries.

[3] We have to use logical reasoning because empirical evidence is not clear enough at this point to warrant definite conclusions and because further empirical research needs to be based on hypotheses built from theoretical reasoning.

Other cost-saving devices such as double shifts are also impractical in most cases for the same reasons. Only biannual recruitment schemes--by which two age cohorts are recruited simultaneously and there are no recruitments on alternate years--might allow some economies of scale to appear. But one must remember that, beyond a certain point, increasing the enrollment rates means mainly reaching children in more remote area. If durable building materials are to be used, the probability is that the building cost will increase because it will become more and more costly to bring these materials into the villages where schools are to be built.

Increased class size. We have seen in Chapter 5 that the average class size is already very large in sub-Saharan Africa--in urban areas, so large that the quality of education is impaired. And, as we recalled in the preceding subsection, in rural areas it is in most cases impossible to increase class size because pupils would have to walk too far to go to school.

More efficient role of school administration. It is theoretically possible to lower costs through better administration and planning of the school system at the national level when the school system develops. A planning cell may be created at some point and then, some time later, reach the critical size which allows it to work efficiently. But history shows us that bureaucracy often has a tendency to become top-heavy and to induce diseconomies of scale if a strong political will and a clear vision of the needs of schools do not prevail at the top.

From the above we may therefore conclude that the general prospect is rather dim for realizing future economies of scale in primary education, especially in sub-Saharan Africa. But of course the situation varies from one country to the next and from region to region in each country, so that only carefully designed empirical studies at the local level can give us a definite answer. And we must also remember that empirical evidence taken from cross-sectional studies does show that the "real" cost (or the "effort" in favor of education, as we called the cost in terms of the proportion of real resources used) is lower in countries where the rate of enrollment is higher. Although, strictly speaking, this has nothing to do with economies of scale as they are usually defined and can be explained by a change in the relative scarcity of people qualified enough to become teachers when the education system expands, it tends to show that unit cost does not grow as fast as national income (because enrollment rates are positively correlated with level of GNP per capita). If it can be shown that quality of education is not systematically lower in countries where the rate of enrollment is high, this type of evidence may be good news indeed, since it indicates to the developing countries that their financial effort per pupil will tend to go down, other things being equal, as the enrollment rate goes up.

Secondary Education

The outlook for economies of scale may be brighter in secondary than in primary education.

General education. Here the pressure of demand is very high and rates of enrollment still very low, and there are more opportunities to experiment and to try to find the optimal school size. Of course, quality-improvement considerations will enter the picture, and unit cost might not always go down, but cost effectiveness should improve with better school design.

Technical education. Technical schools have to be large to be cost effective. They take time to fill up, so that unit cost should go down in each new school during the first year after the opening.

Higher Education

Here is the best case in favor of economies of scales. To reach a minimum level of excellence, universities have to carry on research, and research laboratories have to have a certain minimum size. Furthermore, it is more efficient to plan the size of a new university according to future enrollment targets. Finally, teachers have to be well paid if a minimum of academic proficiency is to be reached. For these reasons (and others), the unit cost per student has to be extremely high in newly opened universities, but it should go down as expansion takes place.

Evidence for sub-Saharan Africa seems to point in this direction. The existence of very high costs per student in that part of the world is well documented, and costs seem to be decreasing when the number of students goes up. Of course, one has to be very careful in interpreting these data.

o As G. Psacharopoulos points out, "the documented fall in unit costs might not only reflect returns to scale, but also a fall in the quality of education provided by university institutions" (Psacharopoulos 1980, p. 31).

o It is also clear that authors, such as Dunworth and Bottomley (1974), who have concluded that economies of scale exist in the universities of advanced countries have never been able to prove that quality has remained constant when unit costs have decreased.

o Comparisons between schools of different sizes are usually not made (or sometimes cannot be made), other things being equal. For instance, a comparison of recurrent unit costs in two types of primary teacher training colleges in Malawi (1978 World Bank education sector survey data) clearly shows that the difference in favor of missionary colleges is due to two factors, neither of which has anything to do with the fact that they are of smaller size: missionary colleges are filled to capacity and national colleges are not; and missionaries are paid less than lay teachers. And the evidence purporting to show that unit cost in national colleges would go down slightly in one college and sharply rise in the other if they were both filled to capacity is not valid because the comparison is between observed historical costs and norm-referenced future cost.

This example and the observations made above remind us of how difficult it is to isolate economies of scale from other factors influencing unit costs. But it still seems safe to conclude that a decrease in unit costs due to economies of scale may be expected in the coming decade in most African universities.

CHAPTER 7

THE INFLUENCE OF REPETITION AND DROPOUT RATES ON UNIT COSTS OF EDUCATION

Repetition and dropout rates are extremely high in many developing countries. In the late 1970s, for example, in seventeen out of the eighteen countries of Francophone Africa for which we have comparable data, over 10% of enrollment in primary education consisted of repeaters. This rate was above 20% for ten of the countries and above 30% for four of them.

Dropout rates were also very high in most countries of the same group. Sixty-nine percent of the children who entered primary school failed to finish it in Benin, 58% in Gabon, 54% in Mali, 40% in Chad, and 38% in the P.R. Congo. The two phenomena of repetition and dropping out are often thought to be positively linked, and their joint effect on cost is thought to be important. Consequently, their reduction is often presented as one of the most efficient ways to reduce unit costs.

But the effects of dropouts and repeaters on costs are not the same. The effect also varies depending upon the unit one uses to measure unit costs. Finally, the net impact on costs depends upon the cost implications of the remedial measure taken to lower repetition and/or to reduce dropping out. Before looking at these issues, however, we must decide whether repetition is truly and always a "waste."

Repeaters and Dropouts as Wastage

"Wastage" is a term used to describe the failure of the educational system to achieve its objectives. Since one of these main objectives is to transmit certain levels of knowledge to students by leading them through a cycle of studies, planners have tended to consider that taking more time than normal to complete a cycle, or dropping out before having completed it, is a "waste." As a result, many statistical studies were made in which the term wastage was used to represent repeaters and dropouts. [1] But this characterization of dropping out and repetition begs several questions.

The Case of Repetition

Those who consider repetition to be a waste implicitly assume that there is a "normal" rate of knowledge acquisition and that school cycles have been built up so that the yearly programs correspond to what can "normally" be assimilated. They are comforted in their conviction by the results of most of the research in this field. Two main conclusions seem to emerge from this research. First, repetition does not seem to increase significantly the level of school achievement or the amount learned by the repeaters. Second, repetition seems to have a negative psychological effect because it tends to lower the pupil's self esteem, to make his or her attitude toward learning less positive, and to damage peer relations. [2]

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[1] Unesco played an important role in promoting that type of research. For a thorough description of the concepts, the measures, and the methodological problems encountered, see the report produced by the Office of Statistics in November 1980 (Unesco 1980).

[2] For a survey of the evidence, see Haddad 1979.

This does not mean, however, that an automatic promotion system would be free of waste. It is also well documented that children do not all acquire knowledge and/or attitudes at the same rate. To promote the "slow learners" automatically without devoting special attention to them during the school year makes them less and less able to understand and to assimilate the curriculum as they reach higher grades. "Fast learners" may also have the feeling that they are wasting their time when they are placed in classes where the teaching schedule is geared to the potential of "average" pupils. There is some evidence which shows that children learn more when placed in groups of similar ability.

The optimal school system would therefore be one in which the length of each school cycle would vary according to the learning capacity of the pupils. But compared with the present uniform system, such a reform would entail extra costs which would have to be taken into account before deciding whether net costs would go up.

The Case of Dropping Out

Dropouts are considered as a waste because each school cycle is taken as a logical entity which should be attended in its totality if the pupil is to reach a certain level of competency. But this position is certainly too extreme. Learning is a continuous process, and one can hardly assume that a student who drops out just before the end of a cycle has learned nothing at all. It is true that the so-called basic skills (reading, writing, arithmetic) cannot be assimilated in less than some minimum time spent in primary education. But beyond that minimum, it is probably more accurate to measure the amount of "human capital" acquired by the time spent in school. Furthermore, schools do much more for students than transmit new knowledge. They help to play an important role in shaping children's attitudes and transmitting social values. Of course, it may be argued that those who drop out may do so because they do not share those values, but economic and institutional reasons seem to be, in most cases, the main determinants of dropping out. Before concluding that all dropping out and repetition are purely wastage, one should look more carefully at what the students who do drop out have learned from the school before they left.

Effects of Repetition and Dropping Out on Costs

The case of repetition is different from that of dropping out. One more repeater is one more student to be taught in a given year; one other student dropping out means the opposite. The total number of student-years to be provided is therefore the first problem to be considered. But the true balance sheet would also have to consider what quantity of human capital students have acquired before leaving. Finally, the net effect on cost will also depend upon the cost of remedial measures intended to reduce repetition and/or dropping out.

Repetitions, dropouts, and student-years

Since repetitions and dropouts affect the number of student-years to be provided for all entrants to go though a cycle, the number of student-years will depend upon the relative magnitudes of the two phenomena and upon the stage at which dropping out takes place.

Simple simulations show that, if the number of dropouts is relatively high compared with the number of repetitions and if they occur early in the cycle, the number of student-years will tend to be lower than it would be if all students went through the whole cycle without repeating. It is only in the opposite case, when repetition rates are relatively high and dropping out occurs mostly late in the cycle, that one can be sure that there is a significant increase in the number of student-years that have to be provided.

Dropouts and Human Capital

If it is assumed that the students who do not graduate have not acquired anything in school, then the years of schooling they have received before dropping out are clearly wasted. If we make the opposite assumption--that students who drop out accumulate as much human capital while in school as those who ultimately complete the cycle--and then compare the number of student-years provided with some indicator of human capital acquired, we see that dropouts have no influence on the "cost per graduate equivalent."

The truth must be somewhere between these two extremes. Clearly some education can be acquired in less than a full educational cycle, and one should not assume that the amount spent to teach future dropouts is totally wasted. We have no indicators of what the educational value of an uncompleted cycle might be.

The Net Cost Effect of Policies to Reduce Repetition and Dropout Rates

Several conditions have to be met if the effects on cost of policies to reduce repetition and dropout rates are to be favorable. Also, in countries where primary education enrollment rates are still low, the effects of such policies have to be considered separately.

The general case. For the net effect on total cost to be positive, the overall effect on enrollment has to be negative, and the effects on savings due to a smaller number of students enrolled must be greater than the cost of the measures used to reduce repetition and dropout rates.

The direct effect on cost can be negative only if the number of students decreases. That is what people assume when they say that, if repetition rates are equal in each grade, one can reduce the total number of students in a cycle by a percentage equal to the repetition rate by deciding upon a policy of automatic promotion. But this reasoning applies only to repetition. If the number of dropouts is substantial, and if policies to reduce dropping out are implemented at the same time, the reduction in total enrollment will be less. Total enrollment may even increase.

The direct effect on cost will be less than proportional to the effect on enrollment because of the existence of fixed costs. In the short run, a high proportion of total cost must be considered as fixed. Not only are school buildings already there, but teachers cannot usually be dismissed easily. In the longer run, the cost of teachers may decrease because there will be fewer hirings, so that total cost will be more affected--especially at the primary level, where teacher salaries often amount to 90% or more of current expenditures.

The cost of the remedial measures taken to reduce wastage will depend upon the type of measures. Some measures, such as automatic promotion and revision of examination standards, are essentially costless. But there are reasons to question whether they will significantly reduce dropping out. First, if they induce students to stay who were discouraged because they were forced to repeat a grade, they may also discourage some who find themselves promoted without having gained an adequate foundation for further learning. Second, they will not have any effect on those who drop out for personal, economic, or family reasons or who are "pushed" out of school for lack of places in the higher grades (as is often the case in poor countries). Costlier remedial measures such as better teaching aids, compensatory programs, and individualized or nongraded instruction are needed if one really wants to get rid of wastage. As a study made more than ten years ago by Unesco (Berstecher 1970) purports to show, such measures may tend to reduce cost per graduate, but they will increase total costs.

The case of primary education in developing countries. Many developing countries, especially in sub-Saharan Africa, still have low enrollment rates in primary education. All aspire to come close to universal primary education, and reducing repetition rates may appear to be an essentially costless way to increase the intake of primary schools. Each student who was promoted instead of repeating would make a place for a new entrant. Here the problem is not to reduce cost but to bring more children to school without increasing cost and without lowering quality.

It is an error to conclude, as Unesco did in its report to the 36th International Conference on Education in 1977, that in 1970 "repeaters constituted about 15 percent of total enrollment in primary education in Latin America, 15 percent in Africa and 18 percent in South Asia. In other words, the number of children of primary school age admitted to school could have been increased by some 15-20 percent in LDCs without increasing the cost had there been no repetition." This statement is incorrect and misleading. Children of primary school age can only enter the first grade. It is the percentage of repeaters in the first grade which determines the number of additional places that could be made available. Furthermore, repetition rates are not equal in different grades, so that automatic promotion would produce different changes in the number of pupils per class in different grades. This process of implementing automatic promotion would certainly not be costless. Finally, there is no correspondence between repetition rates and new demand by community or region. In most urban areas repetition rates are very high, and unsatisfied demand is generally small.

Although the problem is more complex than is often thought, some points seem clear. First, high repetition rates constitute educational problems: negative effects on many children and positive effects on few. Second, lowering repetition rates does make room for new entrants, although the ratio is not one to one. One may therefore conclude that further studies should be made, country by country and level by level, using simulation methods. It is probable that lowering repetition rates where they are very high will have positive effects on students and may contribute to lowering total cost or to enabling more children to attend school.

PART III

THE PROBLEM OF COST RECOVERY

INTRODUCTION
TO PART III

Education is a good which is demanded for many reasons. In the jargon of the economist, one would say that it is at the same time an investment good (a good acquired for the monetary returns one expects to earn from putting it to use in future periods), a durable consumption good (a good whose services one expects to enjoy in future periods), and a nondurable consumption good (a good one enjoys consuming now). Inasmuch as its dimension as a durable good is important, demand for education on the part of individuals [1] will depend on the breadth and accuracy of their information about future benefits to expect from it.

Society as a whole and governments, to the extent that they act as representatives of society, will be concerned by this demand in two cases:

- If there are reasons to believe that individuals underestimate the returns of education, thereby inducing a loss of future welfare in the given society
- If some of the (positive) returns spill over from the individual to the community, thereby making social returns higher than the sum of individual returns.

In the first situation, government might limit its intervention to providing better information to the students and/or their families; but in the second case it should induce them to "buy" more education by sharing the cost with them.

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[1] In the case of education, the problem is further complicated by the fact that demand is often expressed not by the person acquiring the good but by someone else (generally parents); the former is unable to understand and to appraise the future returns.

Here lies the case for public subsidies to education. But unless there are no private benefits from education at all (or people are so poor that they cannot afford to divert even a small part of their incomes from survival expenditures), and unless the collective advantage to be gotten from sending children to school is so high under given circumstances that government feels that public resources should be spent in priority on education, there is no logical reason why education should be offered *free* to the public. The problem the economist faces is therefore that of determining the optimal amount of "user charge" which should be imposed for education. As with other types of so-called "public goods" or "merit wants," an optimum can only be reached by reconciling two partly conflicting objectives: efficiency and equity.

Economic analysis of this type of problem is not new; it dates back to the very beginnings of economics. But it is only in the last fifty years or so that "welfare economics" developed as a separate branch of economics, and in the last twenty-five that highly refined and rigorous mathematical models were developed to point out optimal solutions to welfare problems.

In contrast with those highly abstract and purely logical developments, urgent practical problems of public finance have been posed to governments in most countries. As pointed out in the first part of this report, most governments consider that public expenditures on education have reached a level relative to total exenditures and to GNP which cannot be increased in the future. Faced with severe financial constraints, they look not only for ways to lower unit costs but also for strategies to shift at least part of the burden to somebody else. The problem is still more acute in many developing countries where a tremendous effort has been made in favor of education but where the financial squeeze has come at a time when universal basic education is not yet achieved and the absolute number of illiterates is not regressing.

What can economic analysis tell the decisionmaker about these issues? What are the facts, and therefore the real issues, involved? What kind of data should be gathered for the economist to be able to advise the decisionmakers more aptly? Such are the questions which shall be addressed below.

CHAPTER 8

THE ROLE AND LIMITS OF ECONOMIC ANALYSIS

What can economic analysis tell us about the optimal price of education? A rapid look at contemporary writings on welfare economics does not offer one much help in view of the highly abstract and purely logical character of the literature and of its dominant concern with optimal taxing mechanisms in rich countries. But a few recent essays on the education problems of developing countries may be of some help.

The Inadequacy of General Welfare Economics

The purpose here is not to review even a small fraction of the abundant literature which has appeared in the last thirty years. We shall only state some well-known facts about welfare economics.

Economic theory does tell us the following. As soon as we have reasons to believe that a given good cannot be produced at constant returns to scale and/or that the consumption of this given good is not purely individualistic but entails sizable "external effects," social allocation according to market rule cannot be optimal. For such goods, one can define "a frontier of efficient points from which no universally advantageous movements are possible," but one cannot pinpoint "the" socially best solution unless one uses a "specified normative welfare function".1/ By implication, it is easy to see that any normative welfare function has to be based on a concept of equity. But "different concepts of equity all

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1/ This quotation and the preceding one are taken from the limpid and still fully actual article by P. A. Samuelson (1958).

require interpersonal comparisons of utility which take the subject beyond the range of pure economics and require philosophical and ethical judgement" (McMahon and Geske 1982, p.190).

Since these conclusions were reached by Samuelson and others more than twenty years ago, progress has been made in the exploration of the conditions of an optimum, and a great deal of ingenuity has been deployed in building mathematical models, but most of the research has been of a highly abstract and axiomatic character. Until only recently, very little has been directed toward providing the decisionmaker with useful information and methods of financing public goods. [2]

This recent type of economic research tells us that education is a good which cannot be produced optimally under market conditions because it presents the two characteristics mentioned above -- variable returns to scale and important external effects. This by itself is useful because it demonstrates that the historical choice made by most governments to control and to subsidize schools heavily was possibly economically efficient. We can also get from welfare economic theory the notion that it may be efficient to make the buyers pay part of the cost. But things get less clear when equity considerations are introduced. To avoid the logical difficulties involved in calculating the optimal tradeoff, most authors tend to consider as optimal solutions those in which only a very small portion of the cost and of the benefits of the considered educational investment are left in the hands of private individuals.

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[2] A very good example of this type of research and of its limitation can be found in P. G. Hare and D. T. Ulph (1982) and in J. A. Mirrlees's comment on this model (in Bowman 1982).

But as J. A. Mirrlees points out (in Bowman 1982, p. 133), it is difficult to believe that people actually make optimal economic decisions when both costs and benefits to them are very small, although "it is not a consideration that our economic theories allow us to handle." Furthermore, axiomatic welfare economics cannot and does not tell us at what level the user cost should be set in a given concrete situation, how it should be collected, [3] and from whom. But it may help us reflect on the degree of consistency of a particular institutional arrangement--which, again, is very important and not to be neglected for the sake of apparent "realism."

Recent research concerned more directly with the financing of education than the general welfare models referred to above might be of more direct use to the decisionmaker. But, as we shall soon see, it also has its limitations.

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[3] Other than saying that the ideal tax is a lump-sum tax which in actual life cannot be levied.

The Limitations of Current Research on Education Financing

A survey of research done in this field in the last ten years [4] reveals two characteristics which severely limit the utility of the research to decisionmakers in developing countries.

- Most of this research concerns developed countries, principally the United States.
- Most of this research concerns higher education only.

Moreover, the few studies of developing countries concern middle-income countries, not the poorest, and deal with their present situation and not with what could be done to find new resources for education. But if one may say that these studies are also of little immediate use in helping to solve the problem with which we are concerned, this does not mean that nothing useful can be gathered from them--on the contrary.

First, much more attention is now paid to equity considerations than before. As a consequence, our knowledge of the different concepts of equity which are being used and of their links with different philosophical theories of justice, as well as that of the practical consequences of adopting each one of them, has been improved. [5] As a consequence, economic analyses of these welfare issue have become much more accesible to noneconomists. For instance, the link betwen Pareto optimum and the concept of commutative equity (which recognizes to every citizen a property right on the product of his activity) is now clearly grasped. [6] Another consequence of this increased interest in equity considerations is that,instead of reasoning only in terms of tradeoffs between efficiency and equity, several authors are exploring the situations in which efficiency and equity are joint products which can be simultaneously increased through appropriate policy measures. [7]

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[4] We shall not attempt to give a full bibliography on the subject. But a look at three recent sources might give the interested reader fairly comprehensive references. These are 1982 World Bank data on Chile, France, and Malaysia compiled by M. J. Bowman, B. Millot, and E. Schiefelbein (Education Department); Bowman (1982); and McMahon and Geske (1982).

[5] For a good description of the different equity criteria and of their effects on income distribution, see McMahon and Geske (1982), pp. 16-22.

Second, by looking at future effects as well as at present effects of education efficiency, studies of the cost-benefit type rightly draw the attention of decisionmakers in developing countries to the plain but often forgotten fact that education is an investment which, like all other investments, is justifiable only if it brings positive returns to the students and to society as a whole.

Third, most of the hundreds of studies which have been undertaken in the United State on the optimal school finance system since the late 1960s (in the wake of the movement of educational finance litigation) have concentrated on notions of equality of treatment and of uniformity of effort. These studies have shown with more precision and realism than before that asking an equal contribution from all families is often tantamount to imposing on them very different financial burdens, thereby putting in

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6/ For a clear and forceful presentation of this doctrine, see Feldman (1971).

7/ See, for instance, Part III of McMahon and Geske (1982).

question the equity of a uniform school fee. This is especially important in poor countries, where such a fee is often the only practical way to make parents contribute to the cost of schooling.

Finally, a few recent studies are beginning to draw attention to the fact that government should not only be considered as an entity representing society as a whole but also as an organization which acts according to certain rules and certain constraints. Cost (and returns) of education should therefore be looked at not only from the point of view of society and from the point of view of the individual but also from the point of view of government. This is especially important because costs, as measured up to now by the economist, do not correspond to what education really costs government--nor do returns. This is evident in table 8.1. As can be seen from the table, forgone taxes replace forgone earnings as imputed costs, and incremental taxes attributable to education replace incremental incomes of graduates as far as government is concerned and should therefore be taken into account in budgetary discussions.

Another reason why it is important to look at the cost-benefit balance from the government's point of view is that, in most developing countries, government itself is the main employer of graduates. In such a case, the state might be able to compensate part of the public expenditure on education by paying lower wages than would be required to attract a suitable labor supply when training is not subsidized. [8]

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[8] 1982 World Bank data compiled by Bowman, Millot, and Schiefelbein (Education Department).

Table 8.1: COSTS OF EDUCATION ACCORDING TO ACCOUNT

COST ITEM	FISCAL ACCOUNT	SOCIETAL ACCOUNT	PRIVATE ACCOUNT
(1) Direct public outlays on education	Cost	Cost	—
(2) Student support	Cost	(Transfer)	Offset to part (or all) of forgone earnings
(3) Forgone earnings	—	Cost	Cost
(4) Income tax on forgone earnings (forgone)	Cost	—	Partial offset on forgone earnings
(5) Other taxes on forgone outputs	Cost	—	--
(6) Incremental earnings	—	--	Gross returns
(7) Incremental product		Return	—
(8) Incremental income tax due to (6)	Returns	—	Deduction from gross returns
(9) Other taxes drawing on (7)	Returns	—	--

Source: 1982 World Bank data compiled by M. J. Bowman, B. Millot, and E. Schiefelbein (Education Department).

Contemporary economic analysis therefore provides important, although indirect, guidelines to decisionmakers in developing countries. But what can it contribute directly to the solution of the urgent problem that goverments of poor countries are facing--namely, how and where to find new resources for education?

Economic Analysis as a Guide to Educational Finance Policy in Developing Countries

Very recently, two analysts have addressed the problem. Trying to keep in close contact with the realities of developing countries, and resisting the temptation to build up sophisticated mathematical models, they have attempted to show under which conditions user fees may increase the efficiency of an educational system without sacrificing equity. [9]

Using these two examples, we shall make a critical review of such attempts, insisting on the conditions which have to be met before user fees can contribute to the financing of education and on the type of information one should have in order to test these models.

The Analytical Framework: Its Main Assumption and Conclusions

It is a quite conventional and quite simple supply-and-demand, static partial equilibrium model. Assuming constant marginal costs and nonzero elasticity of demand, the authors introduce a constraint concerning the amount of money the ministry of education may spend in a given period, given the prices of inputs. This means that a given maximum amount of educational services can be provided free of charge. Assuming further that all other possible sources of finance have been fully tapped, including foreign aid, [10] the conclusion is that supply of education can only be increased if a fee is levied on the users. With such a constraint, it is likely that there will be excess demand for education as long as it will be provided free of charge. Education will therefore be rationed (not all of the children who want to enter school will be accepted, not all those who want to go on toward higher levels will be allowed to do so).

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[9] The contributions of these two analysts, both with the Country Policy Department of the World Bank, are still in the preliminary stage; see Thobani (1983) and Birdsall (1982b).

To the question why education should not be offered at a price equal to its marginal cost, the authors answer by recalling that, in the case of education, there is strong evidence pointing toward the existence of market imperfections and of positive externalities. As a result, one may assume that the social demand curve is above the private demand curve, so that to charge the full social cost would induce consumption below the social optimum. But the quantity of education which can be provided free of charge by the government is also below the social optimum. The problem is therefore to determine the optimal "price" to impose on the students or their parents.

Given the government budget constraint, this "optimal" price will probably not be that level which would provide the optimal quantity of education--that is, that quantity for which social demand is equal to marginal cost. But, given certain conditions of demand and of cost, it is possible to show that a positive fee will bring larger social benefits than the zero-fee situation and that there is a level of fee which maximizes social benefit given the contraint, thereby constituting a second-best solution as can be seen in Figure 1.

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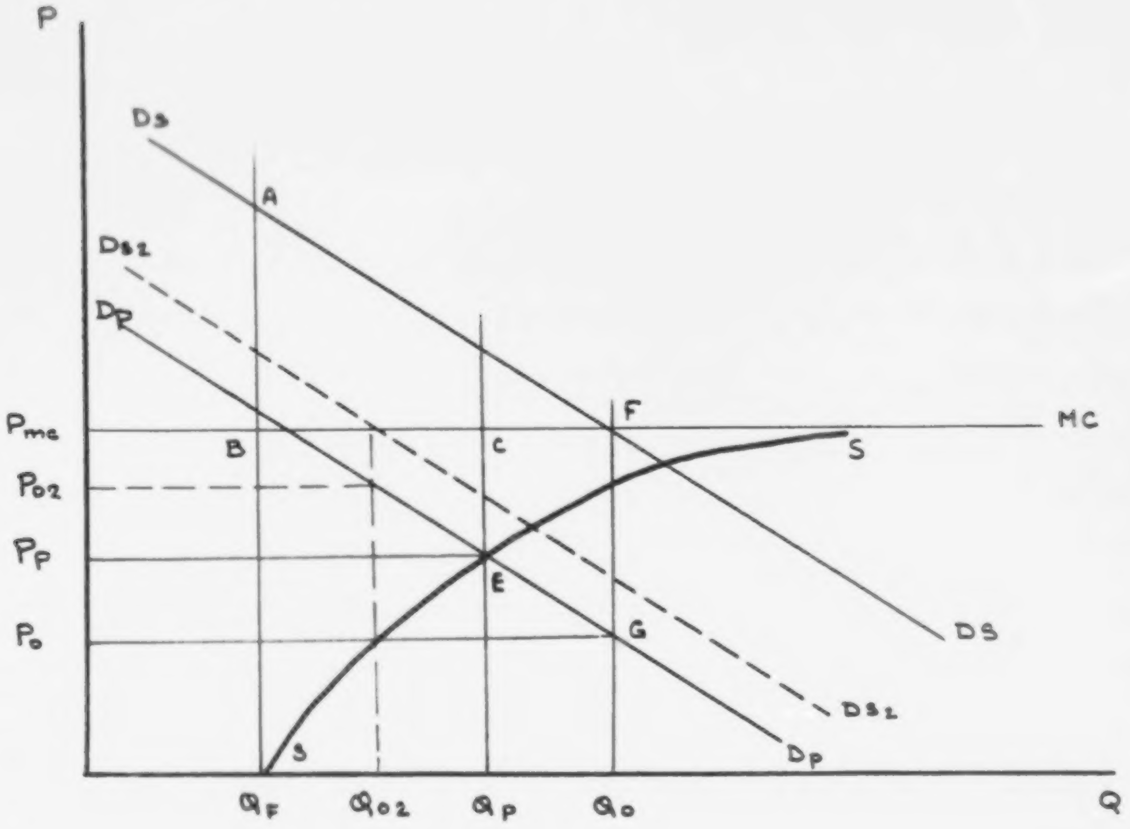
[10] Neither Thobani nor Birdsall mention this specific source of finance, but their specific objective is to study the effects of user fees on demand.

The "best" solution would be to set the fee at OP_o because private demand at that price would equal social demand at OQ_o. But, given the budget constraint, the government could not finance the difference between marginal cost and price (given by the surface of the $P_{mc}FGP_o$ rectangle), which is larger than the surface of the $P_{mc}BQ_fO$ rectangle (representing the education budget).

The "second-best" solution is therefore the provision of less education (OQ_p) at a higher "price" (OP_p). But it clearly increases benefits to society (by an amount represented by the surface ADCB) compared with the no-fee solution, and it makes excess demand disappear.

Only efficiency considerations have been introduced up to this point. The use of a unique private demand curve, by assuming that all "demanders" of education have similar tastes and constraints (or that the differences in tastes offset the differences in constraints), allows the authors to dismiss possible effects of fees on the distribution of education among individuals. But equity considerations are later introduced in the analysis in two different ways. The first way is to give pieces of concrete evidence purporting to show that, in real life, very low fees are more likely to benefit the rich than the poor (Thobani 1983). The second way is to apply a household demand model to two groups, the "rich" and the "poor" (Birdsall 1982b).

Figure 1: SECOND-BEST SOLUTION WITH EXCESS DEMAND



Source: Thobani (1983, p. 8, with minor modifications).

P = Price.
Q = Quantity.
D_p = Private demand curve.
D_s = Social demand curve.
MC = Marginal cost curve.
SS = Locus of points showing the quantity of the services the government can provide at different user fees.

The criterion of equity used is the following. Any education policy is equitable as long as it increases the utilization of that service among the poor more than among the rich. If a new universal fee is used to increase equally for all students the quantity and/or quality of educational services offered, the effect tends to be regressive, under the usual assumption of decreasing marginal utility of money. The marginal utility of income spent on fees will be greater for the poor than for the rich, so that their demand will likely be more fee elastic. 11/

But if we assume that in the initial no-fee situation there is a much larger excess demand on the part of the poor than on the part of the rich, it is possible to show that a fee may be equitable. The only condition is that the demand of the "rich" be sufficiently inelastic for the proceeds of the fees to be used mainly to increase the attendance of the poor. 12/ This apparent paradox results from the fact that, although demand from the poor is much larger at zero fee than after a fee has been imposed, a large part of that initial demand was not satisfied because of the budget constraint. As long as excesss demand on the part of the poor has not disappeared, the increase in fee will increase the enrollment of the poor unless their demand is infinitely elastic and will increase it by more than it will increase the enrollment of the rich.

11/ The fee elasticity of demand on the part of the poor could only be smaller than the elasticity of the rich if the poor had a much higher "preference" for education than the rich. Because it is difficult to believe this would be the case unless the poor expected to benefit much more than the rich from education, it does not seem unrealistic to assume higher fee elasticity for the poor.

12/ For a diagrammatic presentation of this type of situation, see Birdsall (1982b), p. 19.

From this summary of recent economic analysis of the potential effects of raising school fees, the possibility of increasing both the efficiency and the equity of education by raising fees seems to hinge upon the existence of excess demand at the start. But Birdsall (1982b) attempts to show that fees may contribute to more efficiency *and* more equity, even in the absence of excess demand, if other conditions are satisfied.

Using a household demand function framework, she first notes that demand for education does not depend only upon the cost of education but also on the characteristics of schools (namely, the quality of their service offered and their distance from the home), on the characteristics of the household (income and the opportunity cost of the child's time forgone), and on the characteristics of the child (sex, ability) and the prices of other goods consumed by the household. If the government uses the proceeds from fees [13] to improve the quality and accessibility of schools, this will tend to increase households' demand for education. The net result will depend upon the relative elasticities of demand and on the marginal costs conditions. It will be positive (net demand will increase) only if:

- The (positive) effect on demand of the improvement in quality and distance is stronger in absolute terms than the (negative) effect of the increase in fee.
- The expenditures on quality improvement and/or distance reduction do not induce an equal increase in marginal cost.

Thus, efficiency *may* be increased even in the absence of excess demand at the start.

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[13] These proceeds will increase with the level of the fee if the elasticity of demand is less than unity, but they will always be positive if we start from a no-fee situation unless elasticity equals $-\infty$.

The same argument may be used with respect to equity. It is assumed that the poor, on average, are offered schools that are of lower quality and/or are more distant from their homes. Equity will be increased provided that:

- Fees are used to increase quality and/or lower distance for the "poor."
- The fee elasticity of demand of the "rich" is sufficiently low to ensure increased revenues.
- The (positive) effect on the poor's demand of the increase in quality and/or the lowering of distance is stronger in absolute terms than the (negative) effect of the increase in the fee.
- The increased revenue is sufficient to improve the quality and to provide a larger number of school seats.

These conditions are very stringent indeed, and the whole analysis deserves a critical look if we want to ascertain its validity and effectiveness.

The Analytical Framework: A Critical Survey

These analytical constructs must be judged from two points of view. First on their own terms as pieces of logical reasoning; second as possible aids to policy. The economic analysis is, of course, fairly crude. This is not necessarily a shortcoming because it was not meant as a purely theoretical exercise but as a model which could be tested with available data. But it still raises questions, since some of the conclusions are dependent upon the particular specification of the model.

The supply and demand model and its graphic presentation leave many questions unanswered and contain several inconsistencies. Because it is not our purpose here to engage in an academic argument, we shall only point out the problems which may weaken the persuasive power of the practical conclusions.

First, of course, it is a purely static, partial equilibrium model, and its appropriateness might be questioned on the ground that education is an activity and a process which has long-term effects, both intended and unintended. The authors are conscious of this fact but satisfy themselves with adding a few long-term considerations which do not fit into the model. [14] Second, the demand curves are drawn in such a way that they leave the reader confused.

- o Marginal revenue curves and not demand curves should be used to determine the socially optimal quantity of education.
- o The use of a straight line implies increasing price elasticity of demand when the price goes down, which is probably not what the authors intended and makes interpretation of the results difficult.
- o It is assumed that the private demand curve of the "rich" is the same as their social demand curve (Birdsall 1982br, p. 18). This is presented as plausible, but the reasons given exclude the possibility of positive externalities, and one does not see why education given to "rich" children should not have positive effects on society as a whole. If such externalities were taken into account, the results might not appear as socially optimal.

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[14] Some of these long-term considerations, especially those about the beneficial effects of more education on income distribution, are too simplistic to be taken seriously.

Third, marginal cost of education is assumed to be constant. Not only may this hypothesis be questioned in the case of a service the production of which entails high fixed costs, but the authors may also be accused of not showing that if marginal costs were decreasing it might not be possible at all to determine the optimal quantity of education by using this type of model. Finally, it might be said that Birdsall (1982b) tends to overstate her case by showing only situations when efficiency and equity are improved, when it is easy to see that a slightly different position and/or slope of the curves on her graphs would have given different results. This problem will be taken up later because it is crucial when one looks at the possible use of the model as an aid to policymakers.

In addition, the household demand function, as it is presented, is not very useful and may even be dangerous. First, it puts side by side explanatory variables which are not homogeneous among themselves. Some of them, such as household incomes, may act only as constraints; some are a subset of a broad category (for instance, school fees, quality of schools, distance); and some are but characteristics of the good demanded. One may ask why only those characteristics and not others such as quantity, are offered (at least in excess demand situations).

Second, nothing is said about the type of functional relationship assumed between each one of those variables and demand for education. But the presentation of the function may lead one to think that the same type of relation is assumed, so that multiple regression analysis is in order. As soon as one feels that one has to distinguish between different groups such as "rich" and "poor," one seems to assume discontinuities in at least some of those functional relationships. [15] But these shortcomings and/or obscurities are critical only inasmuch as they infringe on the model's usefulness as a guide to policy decisions.

The model's usefulness for policy rests heavily on two implicit assumptions. The first assumption is that all the conditions which are (more or less precisely) stated in the model in order for fees to increase both efficiency and equity in education can be met. In one case at least, the authors' reasoning itself leads one to doubt that this can easily be the case; in other cases, empirical considerations show that some caution is in order.

The logical problem lies with the condition, found in Birdsall, that "any increase in marginal cost associated with the quality improvement or distance reduction does not absorb completely the increase in revenue associated with the fee" (Birdsall 1982b, p. 12). As a matter of fact, if we assume that cost conditions do not change, it is difficult to see why, in the situation of constant marginal and average costs, an increase in quality should not induce a corresponding increase in average and marginal cost. The problem is different with distance reduction because, presumably, new facilities could be built at the same unit cost as the old ones. One therefore has to assume that at least part of the improvement will be in the form of distance reduction to believe that the above condition can be met.

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[15] Some of these problems are recognized in the last part of Birdsall's (1982b) paper, but the way proposed to deal with them is, to our mind, a little overoptimistic in the sense that it is supposed that simple household surveys will give the opportunities to test all types of hypotheses concerning the shape of various functional relationships.

One other important condition of the improvement in efficiency and in equity is that the total proceeds of the fee (or at least the largest part of them) be used to increase the quantity and the quality of education offered to the poor. If one admits, as Birdsall does (1982b, p. 29), that in actual cases important political and logical problems may arise, one must conclude that the following should be expected:

- Part of the official fee will never be recovered.
- A part (which may be large if the system is complex; e.g., with a fee level varying according to household conditions) of the recovered fee will go to cover administrative expenses.

Needless to say, the government should resist the temptation to use this revenue to finance another "urgent" program. It is extremely important to keep this in mind because, if the fee is not used to offer more and better education, not only will the efficiency and equity objectives not be met but one also can expect strong resistance by the parents to this new tax. [16]

The equity objective is specified by reference to two groups: the "rich" and the "poor." This dichotomy, as the authors admit, does not do justice to the complexity of social structures. If the model were complicated in order to include several income groups, one should expect to observe that the poorest of the poor are more sensitive to fees than the less poor and, therefore, that the levy of a fee might at the same time increase the school attendance of the children of the latter group and decrease that of the children of the former group. If such is the case, what can be concluded about equity, even if the net overall effect on demand is positive? [17]

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[16] If the fee concerns only an especially powerful group, such as the parents of university students, the opposition may very well exist and prevent the implementation in any case.

Quite logically, qualitative aspects of education are taken into account, and it is argued that, if quality is improved, the nature of the product as seen by the prospective consumers changes. As a result, a new demand may be generated. But this amounts to saying that if the parent can be convinced that the school in which they felt their child was wasting his or her time (because he or she did not learn anything which could be used to improve his or her socioeconomic status sufficiently to offset his or her forgone production and/or earnings) is becoming much "better," they may change their attitude.

These quality improvements, then, mean much more than more textbooks, better trained teachers, more teaching aids. They mean a school more relevant to the needs of a given social group. This is probably the major problem facing the school systems in many poor countries, especially in rural areas, and great care should be exercised not to confuse lack of

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17/ Of course, one could either assume that the children of the poorest households do not attend because they are less able, less motivated (Birdsall 1982b, p. 21), or take a cynical attitude, observing that in all societies social policies benefit the lower-middle strata in the best of cases but never those who are really destitute.

relevance with poor standards in the teaching of a relevant curriculum. [18]

The second assumption is that the data necessary to test these models are available or can be made available without too much trouble and at fairly low cost. On this point one may feel rather dubious for several reasons.

As could easily be seen in the presentation of the models, the "second-best" solution is always very sensitive to the level of the independent variables. If we take the case of demand, we see in Figure 1 that the excess demand which exists when the price to the user is zero may disappear even with a very modest fee if the private demand schedule is highly elastic with regard to price. In such a situation, almost any fee could push the level of demand below that of supply, thereby creating a situation of excess supply and lowering the efficiency of resource allocation. Likewise, if the difference between social demand and private demand were small, setting the fee at P_p to eliminate excess demand would induce a "consumption" of education in excess of the social optimum ($= Q_{o2}$).

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[18] This point may be linked with the one concerning external effects. It is usually assumed (in Birdsall 1982b, p. 27, for instance) that external effects of education are positive and greater among the poor because of the role an educated person can play in an uneducated community. But it has often been observed that teenagers coming from peasant families, when they return to the farm after having learned pieces of an urban culture, tend to feel scornful of their parents' way of life. They are unable to help the parents improve their methods of cultivation because they have not learned the appropriate skills and they have forgotten the traditional ways, so that their productivity tends to be lower after school than before. This, therefore, is a case of negative external effects of education on the poor community.

Looking at marginal cost, one sees that one should know precisely by how much it would be raised by the quality-improving and distance-reducing expenditures in order to determine what would be the increase in the supply of educational services.

These examples show that a very accurate knowledge of the characteristics of demand and of cost is required to determine the optimal fee or even to decide whether any fee at all can be justified on efficiency grounds. [19] The data which have to be known with accuracy are numerous, and their range wide. They have been quite clearly and precisely enumerated by Birdsall (1982b, p. 30 ff.). A close look at the five categories she distinguishes shows three things.

First, most of these data are not available at present in poor countries. This is obviously true of the data falling into the last three categories of data needed to test the demand function.

- Data concerning exogenous variables common to households grouped by location (such as fees, quality of school, distance, etc.) have to be gathered at the local level.

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[19] We therefore must caution against hasty conclusions drawn only from the facts that there is rationing of school seats and that the poor are more excluded than the rich. Contrary to what Birdsall states (1982b, p. 39), this observation is not sufficient to warrant the conclusion that "an increase in fee which permits the expansion of the system will be more equitable as well as more efficient."

- o Data concerning choice variables for each household can be gathered only through specifically designed household surveys.
- o Data which capture the existence of rationing can be gathered partly at the national level (existence of national entrance tests) and partly at the local level (administrative area the schools cater to).

But the situation is actually not much better for Birdsall's other two categories. Most of the exogenous variables specific to households--such as total income, child and parent characteristics (age, sex, ability, health states, ethnic group, and level of education of parents), and the opportunity cost of a child's time--are not measured in most household income or expenditure surveys (when these exist at all) or are measured in an inappropriate way. This is particularly true of income in countries where only a small minority of the work force earn wagesfrom employment in the modern sector of the economy and where most of the production of the traditional sector is not exchanged on a market for money. As for the last category, costs to the government of delivering the educational services, we have seen earlier how unsatisfactory the statistical information is.

Second, Birdsall's data indicate that progress in data collection and analysis is urgent. This means not only the constitution of reliable cost data banks but the multiplication of household surveys. The recent trend in that direction and the important role the World Bank seems willing to play are very encouraging indeed. These household surveys have to be specially designed, but they should not be multiplied in the same country. They are costly, and the experience of developed countries shows that a tendency of households to refuse to participate tends to build up when the frequency of such surveys (and their tendency to overlap) goes beyond a certain point. The solution, therefore, is to try to set up cooperation among all agencies and research groups working in the field of human resources development so that questionnaires will be integrated.

Third, Birdsall's data suggest that, because there is still very little experience with this type of survey, with the type of data which can be gathered directly when surveys are not possible, and with the way to go about gathering these data, it is urgent to bring the interested parties together for regular discussions. A few hours spent in such interchange might avoid mistakes, which are costly not only in terms of money but also in that the inappropriate or unreliable data sometimes gathered through ill-designed questionnaires are used to make policy recommendations.

In conclusion, a review of recent research on the financing of education in developing countries shows that the type of research which is developing at present has, as we have seen, some shortcomings. But most of these (economic analysis that is not always fully convincing, too much distance between theory and practical problems) are because this type of work is still at an early stage. Compared with these shortcomings, the positive contributions of the research are quite substantial indeed.

First, the supply and demand model combined with the household demand model has the great didactic advantage of showing that, contrary to what was up to now currently admitted, an increase in fee not only may be economically efficient but also may be equitable (in a broad sense).

Second, this type of analysis shows, at least by implication, that the absence of observed excess demand does not mean that the families are satisfied with the service. On the contrary, the conjunction of low enrollment rates and of no apparent excess demand should be interpreted as showing that the service provided is considered by many families as inappropriate. [20]

Third, by introducing as a constraint the maximum subsidy for education, this type of approach allows a distinction between the state as an organization and the state as the representative of society as a whole. In the latter capacity, the state will attempt to measure and to satisfy social demand for education--that is, to take account of the factors (market imperfections, external effects) which make private demands an inappropriate index of "need." In the former capacity, the state will allocate budgets to the various government branches (including the ministry of education) according to the total amount of resources it is able to gather and to the relative bargaining powers of the parties involved. [21]

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[20] The main reason why the families feel that way may differ from one group to the other and therefore should be explored. Some may feel that the closest school is too far from home, some that the quality of the teaching is too low, some that the curriculum is not relevant.

[21] It is all the more important to consider the state in its two capacities because, in the case of primary education, the only reason for imposing a fee is to allocate the financial burdens on government. The other argument in favor of user fees, that providing a good free of charge induces its consumption, does not apply in this particular case because it is difficult to see how one can consume too much universal primary education.

Fourth, by addressing themselves specifically to the case of developing countries, these studies come closer to having a direct usefulness to the decisionmakers faced with the dilemma of the growing gap between public resources and social demand.

Fifth, these studies insist quite forcefully and cogently on the need to gather more empirical evidence at the local level, especially through household surveys. This last point is very important because national statistics, even improved according to the recommendations made in Part I of this paper, will never give some of the information which is absolutely necessary for an effective cost-benefit, or even an effective cost-effectiveness, analysis.

But it should be recalled that this type of research explores only the possibilities and consequences of one type of measure intended to alleviate the financial burden of education to the government--namely, the levying of fees on households. In the final chapter, we shall turn to a survey of all the possible sources of education finance and of what concrete evidence exists on their respective levels.

CHAPTER 9

FACTS AND ISSUES IN EDUCATION FINANCE IN DEVELOPING COUNTRIES

As stated in Part I, many governments seem to hold as true that the cost of education is "too high." By that they mean partly that the school system, as it is organized at present, is inefficient and therefore that savings could and should be made. As we have also seen in Part I, little has actually been done in cost saving, and the prospects for doing more and better in the future are rather dim, for political as well as for economic reasons.

But when they speak of high education costs, government officials also mean that they fear that the state will not be able to keep assuming for long the overwhelming part of the financial burden. The next logical step is therefore to look to other groups who could contribute to the financing of education. Four other groups are usually distinguished by students of public finance:

- Firms
- Local governments and communities
- The "rest of the world"
- Households. 1/

Let us review the possible contribution of each of these groups in this order.

1/ One other group, philanthropists (or patrons), is sometimes referred to. But its role in poor developing countries is usually so marginal that we shall disregard it. One other, new possible source of finance of recurrent costs is the school itself, through its productive activities. We shall therefore treat this possibility at the end of this chapter.

Firms

The argument in favor of firms' participating in the financing of the schools is twofold: firms take advantage of the higher productivity of trained workers, and each firm has its own organization and should therefore assume and finance most of the vocational training if it wants workers adapted to its needs. Yet governments are generally reluctant to let firms have full control over the curriculum of schools which grant degrees. What, then, is the situation now? Can government expect an important contribution by firms to the cost of education?

One initial remark concerns the number of students involved. One may assume that only students in technical and vocational schools can expect their studies to be (partly) financed by firms, and one fact is plain: at present, on average, only a small fraction of the total number of students at the secondary level are concerned, as the data for several West African countries in Table 9.1 show.

Table 9.1:
PERCENTAGE OF SECONDARY SCHOOL STUDENTS IN TECHNICAL EDUCATION.
SELECTED WEST AFRICAN COUNTRIES 1972-80.

COUNTRY	YEAR	PERCENT
Benin	1972	5.4
P.R. Congo	1980	8.5
Ivory Coast	1979	20.0
Mali	1980	4.9
Togo	1976	8.4
Upper Volta	1980	17.5

Source: Unesco and World Bank data.

For the same period, official data indicate that an important proportion of these students attended private technical school: 49% in Benin, 50% in the Ivory Coast, 26% in Mali, 74% in Upper Volta, 68% in Togo, and 74% in Upper Volta. [2] These percentages concern generally only the students who attend private schools delivering national degrees. In most West African countries a host of private "schools" delivering their own degrees and sometimes giving only correspondence courses have opened in the last decade or so. If these were included, the proportion of secondary students in private technical education would still be higher. But most of the cost of the private schools in general and of the "unofficial" [3] schools in particular is financed by fees. Their standards are usually poor, and the business community has usually very little contact with them, contributing almost nothing to their expenditures.

Firms do contribute to the financing of technical and/or vocational training in two ways. First, and at least in Francophone West Africa, they do so through a compulsory contribution by employers. This contribution, representing a fixed proportion of the firm's wage bill, has appeared only in recent years--not only in the relatively rich countries, such as the Ivory Coast, but also in some of the poorest countries of the region, such as the Central African Republic. The proceeds of this contribution may be used either to adapt school leavers to their first job or to give on-the-job training to those already employed. The programs may be organized by the firms themselves, but firms may also pay schools to give the training. This is an important financial contribution by firms

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2/ There are officially no private schools in P.R. Congo, where education was nationalized in 1965.

3/ By "unofficial" we mean schools which are not controlled and/or subsidized by the government.

to technical and/or vocational education, and it will grow in the future. But a very small proportion of these funds go to general technical high schools linked with the ministry of education.

Second, most large firms (whether private, semipublic, or public) and so-called technical administrations (the ministry of agriculture, the ministry of public works, the ministry of communications, and so on) have their own vocational schools in most West African countries. These schools are generally very good and provide the firms and administrations with most of the technicians and executives they need.

We may conclude on this point that the contribution of firms to vocational training is already high in most West African countries, but that their contribution to the type of education and/or training provided by establishments under the control of the ministry of education is small or nil and will most probably continue to remain so in the future.

Local Governments and Communities

This source of financing is apparently already included in the figures for public expenditures on education (discussed in Parts I and II). Of course, it is useful for certain purposes to distinguish between centralized countries, where the central government (through the ministry of education) assumes most of the public expenditure for education, and decentralized countries, where regional governments assume most of the task. As far as cost recovery is concerned, however, the problem is the same in both cases. It would be absurd for the central government to turn to local governments, or the inverse, because both levels of government tap the same source of public revenue.

The problem of the contribution of local communities is different. Official data (for example, Unesco Statistical Yearbook data) include such local contributions unless otherwise specified. But most of the time this source is actually not included in the official figures on public expenditures, at least when the funds collected at the local level are not sent to the regional capital to be used by the regional authorities but are spent where they are collected. This source of finance may be potentially significant because the inhabitants of a village or of a town may be more willing to undergo financial sacrifices to open a new local school or to improve the quality of their school than to give a faraway administrative body resources to be used without their consent and probably not in their area. Since the real problem here is that of consent and of control over the use of the resources, local contribution to education can be considered as part of the household contribution and will be studied later.

The "Rest of the World"

This term is used in national accounts to represent all the countries which have economic relations with the nation whose accounts are being drawn. In our case, the "rest of the world" is of interest inasmuch as it agrees to pay for part of the educational services rendered in a given nation at a given time or at least to lend money and/or physical inputs for that purpose. This source of finance is apparently important for many poor countries. But how important is it actually? Can it be expected to increase significantly in the future? These are the two questions to which we shall address ourselves.

The Facts about Foreign "Aid" to Education

It is very difficult to get a comprehensive and accurate picture of the foreign aid contribution to education in developing countries because the aid has many origins and takes many forms (from the "lending" of technical assistants as teachers to the building of a university). Information is scattered in many statistical documents and reports. Usually, different sources give different figures. What we feel to be the most reliable information available is given in Table 9.2 for most West African countries.

As can be seen from the table, the bulk of investment in educational facilities was paid by foreign aid in five of the sixteen countries concerned, and it is known that this same source represented a sizable part of total investment in most others. Foreign aid also contributed a large part of recurrent expenditures at the university level in several countries. The proportion of the foreign teaching staff, usually "loaned" under technical assistance schemes, is also impressive. It was approximately 50% in the second cycle of general education in most countries, higher in technical education, and still higher in higher education (in which it almost reached 100% in two countries). But a closer look at the data shows that, at least from the point of view of cost, the foreign contribution is generally not as impressive as it looks.

Interpretation of the Facts

First, expatriate teachers are expensive for the host country. Even leaving aside teachers who have individual contracts with the ministry of education and whose salary is entirely paid by the host country (and amounts, on average, to three times the salary of an equivalently qualified domestic teacher), one must remember that the "technical cooperants" are

Table 9.2: IMPORTANCE OF FOREIGN AID TO EDUCATION IN WEST AFRICA.

COUNTRY	FINANCIAL FLOW			FOREIGN STAFF (% of total)
	Recurrent Expenditure		Capital Expenditure (% of Total)	
	Total Amount	% of Total		
BENIN (1975)	620 million CFAF	Approx. 10%	Almost 100% of building costs in secondary & higher educ.	1st cycle secondary: 9% Technical secondary: 75% Higher: 33%
CAMEROON (1973)	n.a.	n.a.	n.a.	Gen. secondary: 31% Technical second: 25%
CENTRAL AFRICAN REPUBLIC		50% in secondary; 90% in university	100% of university expends	Gen. second.: 1st cycle: 22%; 2nd cycle 65%; Higher: 95%
CHAD (1976)	n.a.	n.a.	Almost 100%	More than 80% in second. & higher education
CONGO (1979)	n.a.	n.a.	n.a.	Gen. second.: 55%; tech. second.: High; Higher: 41% (of permanent staff)
GABON (1972)	n.a.	n.a.	n.a.	Gen. second.: 72% Higher: over 80%
GUINEA (1979)	58.1 million sylis	5%	High	Approx. 10%
IVORY COAST	n.a.	n.a.	n.a.	Gen. second.: 38% Tech second.:65%
LIBERIA	n.a.	n.a.	n.a.	6.1%
MALI (1974)	n.a.	n.a.	95%	Gen. second: 12%; tech. second.: over 50%; Higher: over 50%
MAURITANIA (1977)	n.a.	n.a.	n.a.	Gen. sec.:approx. 60% Tech. sec.: approx. 80%
NIGER (1976)	n.a.	n.a.	Over 80%	Gen. second.: 70% Average: 50%
NIGERIA (1972)	approx. $20 million (total exp.)	n.a.	n.a.	High in secondary and higher education
SENEGAL (1975)	6 billion CFAF	38% at univ. level	n.a.	n.a.
TOGO (1975)	n.a.		42% during 1st half of 2nd plan - 1971-1973	Gen. second. : 20%
UPPER VOLTA (1976)	n.a.	Approx. 50%; over 60% in higher Educ.	Approx. 75% Approx. 90% in higher educ.	70% in higher education

n.a. Not available.
Source: Unesco and World Bank data.

never offered free. The host country usually has to provide housing, to pay for at least part of the transportation costs, and to pay special bonuses. Sometimes it has to cover part of these salary.

In West Africa the extreme case is that of the Ivory Coast, which has to bear 84% of the cost of this type of personnel. [4] The end result is that each technical cooperant costs the Ivory Coast about three times as much as a local teacher at the secondary level and even more in higher education, so that domestic public expenditure on technical assistance represented in 1980 22% of the total education budget. Even in more "normal" cases where the "donor" country pays most or all of the basic salary, it has been estimated that the budgetary cost of one cooperant in the host country is at least that of an equally qualified local teacher. [5] This means that this form of aid is in any case not financial and may even mean extra expenditures for the receiving country. [6] Direct foreign financing of education projects and/or programs is also often much less effective than one would think by looking only at the provisional cost figures.

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[4] This concerns only the French technical cooperants, but they represent the overwhelming majority. The Ivory Coast is trying to renegotiate this agreement.

[5] See for instance Unesco (on Mauritania, 1978c, Appendix I, p. 2) and Unesco on Senegal (1977a and various reports). The situation does seem limited to West Africa. Heyneman (1980) shows that, in Malawi between 1962 and 1970, foreign teachers cost the Malawi government from 2.5to 1.03 times as much as local secondary school teachers, according to their status.

[6] This does not mean, of course, that is it not important and sometimes vital for some developing countries, at this stage, because of the severe shortage of domestic candidates they may encounter, to be able to count on foreign teachers. It means that, from the ministry of education's point of view, on the cost side this foreign contribution is at best close to zero and in some cases is negative.

First, it is often observed that not all the projects which have been approved and appear in the plans are effectively implemented.

Second, when a foreign aid agency provides only money for the first phase of a project, the receiving country sometimes is unable to interest other donors (contrary to what was expected and planned), and the building is left uncompleted.

Third, a varying but often important proportion of this foreign aid is made up of loans. Loans, as a rule, even if they are called "soft," are meant to be repaid. Some countries do default, but then they find it very difficult indeed to obtain new grants and/or loans. From a long-term point of view, loans do not constitute a supplementary source of financing. They may help finance investments at a certain period, but they impose a heavy burden on the budget when repayment starts.

Fourth, even grants are not totally free of charge. They always entail some degree of dependency on the part of the recipient. Foreign donors, even when they think only of the interest of the developing country, tend to think they know best what is good for it; representatives of donor agencies often tend to give little weight to the historical background. In other words, what is granted is not necessarily exactly what is wanted, and the country has to show appreciation.

In spite of its shortcomings, the constraints it entails, and the fact that it does not always lower the cost to the central government by much, foreign aid is useful and sometimes indispensable. What are its future prospects? Judging from recent trends, they are not too bright.

- The proportion of foreign teachers is going down everywhere. This is in itself a rather good sign because it shows that most countries have been able not only to find domestic candidates to keep up with rapidly growing enrollments but also to replace some of the foreign teachers who were present at the beginning of the 1970s with local ones. But there are also signs that those countries which still find it indispensable for some time to recruit many outside teachers may find it more and more difficult and expensive to do so.
- The amount of financial aid, globally, is going down. Even though the education sector may often be less hard hit than others, the trend is clear.

For example, in the Ivory Coast the percentage represented by foreign aid in total recurrent expenditures on education went up from 10.4 to 15.4 between 1960 and 1970 but was back at 10.5 in 1975 and had gone down to 3.2 in 1978. As far as investment expenditures are concerned, the percentage represented by foreign aid went up from 0 to 47.3 between 1960 1970 but was down to 19.1 in 1975 and to 1.4 in 1978. Unfortunately, this trend is not due mainly to the fact that the demand on the part of poor countries is decreasing because they become more able to finance their school systems themselves. It results from the world economic crisis and more directly from an increasing squeeze on public budgets everywhere. Except in a few very limited cases of countries which in the past have seldom resorted to foreign aid and whose credit ranking is good, the probability of seeing foreign aid replace even a small portion of the expenditure of the ministry of education is almost nil in the short and medium term.

Households

As we have seen in Chapter 8, school fees are usually considered as an inefficient way to cover the cost of education, and any increase of fee is generally considered regressive. It is for these reasons and because education was considered in the 1960s as one of the main prerequisites of economic and social development that most newly independent nations set up essentially "free" school systems. But the facts are not so clear and simple. First, one must not forget that free education has usually meant only the absence of registration fees and not an education which is costless to the families of pupils. Second, important stipends and other subsidies are offered students at secondary and higher levels which may make education not only costless but a source of profit. It is therefore useful to take the case of primary education separately.

Primary Education

Primary education is supposed to be "free" in most countries. But a close look at the situation shows two things: it usually entails various expenditures on the household budget, and it entails costs in excess of actual expenditures.

The actual expenditures include not only inscription fees but also other kinds of fees (contributions to parents' associations, insurance fees, and the like) and expenditures on books and other school supplies. Although they do not always involve monetary outlays, contributions to school construction and to the running of school lunch programs should also be included.

Complete data on these items are almost never available. In Africa, very few special household surveys have been made up to now. From the evidence gathered from various reports (mainly by Unesco and the World Bank), one can give the information on West Africa that is listed in Table 9.3.

As can be seen from Table 9.3, although a majority of the countries of the region do not impose registration fees and although the fees are very low when they exist, in most cases families do have to cover the largest part or the totality of the cost of construction of the school (and generally, in rural areas, of the teacher's house). Furthermore, expenditures on school supplies are never absent, although they are not recorded, and special household surveys are needed to capture them. According to such a survey conducted in Mali, [7] families spend around US$13 in various fees and from US$25 (rural areas) to US$75 (urban areas) on books, school supplies, and equipment necessary to go to school (clothing, shoes, and so on).

If we take these figures as representative of the situation in most of the countries of the region (and there ar

they are), this shows that sending a child to primary school is a heavy financial burden, especially for rural families who have a very low

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[7] These figures are given by Ibrahim Sidibe (1980) and come from a survey which he made himself. This is the only example, to our knowledge, of such a survey in West Africa. Although the survey design is not fully adequate and the statistical methods used are questionable, these figures may be considered as a fair approximation for the region. Another survey undertaken by the Country Program Department of the World Bank's Western Africa Regional Office (RPO 672.72) is currently under analysis. It does not provide information on expenditures on books and supplies but gives evidence on fees which shows that, although education is supposed to be "free" in public schools, "informal" enrollment fees do exist in most primary schools. Discrepancies between the figures given by the headmaster and by the parents, however, show that further studies are indispensable.

Table 9.3: EXPENDITURES OF HOUSEHOLDS ON PRIMARY EDUCATION, 1975-80.

COUNTRY	MONETARY EXPENDITURES			PARTICIPATION IN KIND
	Inscription fees (US$ per pupil)	Other fees (US$ per pupil)	School supplies & equipment	
BENIN		Yes (for alphabetization only)	n.a.	Contribution to construction of school
CAMEROOON	Yes (amount unknown)	Yes (amount unknown)	n.a.	Contribution to construction of school
CENTRAL AFR. REPUBLIC	0	1	n.a.	Contribution to construction (apparently only envisaged)
CHAD	n.a.	n.a.	n.a.	Contribution to construction & repairs of school
CONGO	0	n.a.	n.a.	Contribution to construction & equipment of school
GABON	0	n.a.	n.a.	n.a.
GUINEA	0	n.a.	n.a.	Contribution to construction of school
IVORY COAST	0	Yes (Fee to parents association)	Students pay for books in non-TV classes	Contribution to construction of school
LIBERIA	0	Between 1 & 2	n.a.	n.a.
MALI	Officially 0	13	75 (urban) 25 (rural)	Contribution to construction of school & to cooking school lunch
MAURITANIA	0 in public schools; contribution of parents to current expenditures of traditional (Moslem) schools			Contribution to construction of school
NIGER	n.a.	n.a.	n.a.	Contribution to construction and to repair of school
NIGERIA	2	n.a.	n.a.	n.a.
SENEGAL	0	n.a.	n.a.	Apparently no contribution to construction
SIERRA LEONE	1 (only in grades 1 and 2)	n.a.	8	Apparently, contribution to construction (only envisaged in the future)
TOGO	Between 2 & 3 The parents pay 90% of "other recurrent costs" and 22% of total recurrent costs (certain nonqualified teachers, "moniteurs de village," are paid by the villages).		8	Contribution to construction of school
UPPER VOLTA	n.a.	n.a.	Books & supplies paid by the family	Families generally construct and repair the schools

n.a. Not available.
Source: Unesco and World Bank data.

monetary income. [8] But the total cost is still higher. An important part of the cost is made up of the amount the pupils could have earned if they had engaged in productive activity that they have had to forgo by choosing to go to school.

Of course, this forgone amount depends upon the effective opportunities which are open. In developed countries, where primary education is universal and compulsory and where child labor is not used, there is no such opportunity, and forgone earnings are therefore equal to zero. But in the rural parts of poor developing countries, children of primary school age do help on the farm. [9] It is very difficult to measure what is forgone by sending these children to school. But if we reason at the margin, we may see that the cost may be quite high in some cases. On the one hand, children of primary school age may not be very productive in farm activities, but they may free an adult from domestic or other tasks (cattle herding, for instance) and allow him or her to spend more time in the field. On the other hand, subsistance farmers have to get a minimum of cash in order to pay taxes and to purchase the manufactured products they need. But they can only get this cash through the sale of farm products, and they can only sell the surplus after they have satisfied their own direct needs. The presence of one child (or more) may make the difference--so that the sacrifice of sending him or her to school, although small when measured in monetary terms, may be very high when looked at in this perspective.

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[8] This conclusion would probably be even more valid in East Africa than in West Africa, for two reasons: school fees are usually levied in East African countries and are on average higher than in Western Africa; boarding schools where parents have to pay for boarding are quite common. For instance, it has been estimated that, in Kenya until 1974, 25-30% of the funds needed for the primary level were collected from parents (World Bank Kenya education sector data).

[9] Even more so because in many countries repeating rates are high, so that many children already in their teens are still in primary school.

One may therefore conclude that the cost of primary education to the household is far from negligible and may actually be quite high if all the children of a farming couple leave to attend school. It is therefore difficult to believe that a much larger contribution to the funding of education can be asked from such families in most cases. Furthermore, fairly affluent families already often pay much higher fees to the private schools where they send their children. But registration fees represent only a small fraction of total cost. If it can be shown to the families that most of the extra fee would be used to improve the quality of the teaching (by allowing the purchase of benches, books, and other teacher's aids), one may expect a fairly low elasticity of demand within a given limited "fee" range, and we may find ourselves in the favorable situation portrayed by Birdsall (1982b) and Thobani (1982). But is there any evidence on elasticity of demand for primary education?

A short methodological comment is in order here. Ideally, to be able to calculate the elasticity of demand for a product one should have to observe a situation in which:

- The price of the product has changed as a result of a change in supply conditions, the demand schedule being unaffected
- The product is bought in small quantities at frequent intervals
- The product comes only in one uniform quality.

Only in such a situation may we be reasonably sure that the change in quantity bought is the result of a move along a given demand curve. In actual situations, the best we may expect to observe is a change in price and a change in quantity between t_1 and t_2. We can never be sure that demand conditions have not changed during that time (in technical terms, that the demand curve has not shifted). Nor may we conclude that the quantity demanded will stabilize at the new level, if the good is not bought every day.

In the case of a service such as education, changes in demand will take the form of people entering the market or withdrawing from it, not of "old buyers" buying more or less. The effects of the change in the administered price take some time to make themselves felt, so that it is very hazardous to assume that all other things are equal. It is therefore not surprising that good evidence is scarce on this point. But there are a few cases which deserve some attention.

First, there are at least two cases where fees were lowered. This happened in Kenya (in state schools) and in Tanzania in the mid-1970s. In both instances, the immediate effect was a sizable increase in new enrollments. This could be interpreted as showing a high elasticity of demand, but later figures show not only that the increase did not last but that new enrollments tended afterward to decrease slightly in percentage of the age group. Further studies should be made to interpret more cogently these two successive phenomena, but the hypothesis of a rather high elasticity of demand does seem to be supported by these two cases.

Second, we have some evidence showing a decrease in (relative) enrollments in private schools at the same time that new public schools were opening. This happened during the 1970s in Chad (the percentage of pupils attending private primary schools dropped from 14% in 1966 to 5.5% in 1976), in the Ivory Coast (32% in 1959, 15.5% in 1979), and in Togo (32% in 1976, 25% in 1978), but the opposite happened in Upper Volta.

Third, there is also some indirect evidence about a link between fees and dropout rates of rural children in Mali and Togo. But none of it is precise enough to allow any reliable guess about elasticities.

Two conclusions may therefore be drawn: reliable studies of the determinants of demand for education are badly needed, and the setting up of fees in excess of a few dollars per year would most likely be inefficient and unequitable.

Higher Education

Higher education [10] is much more costly than primary education--both to the state (because higher education needs more and costlier inputs per unit of output) and to the student (because forgone earnings are always, in principle, high at this level). But it is also an educational level where an important part of the cost to the state is made up of the various aid given to the students.

No comprehensive evidence can be gathered on this point for an entire region because sources and kinds of aid vary from one country to the next. It is therefore useful first to present the type of information needed before trying to make a rough evaluation for the countries where some information is available.

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[10] We shall not treat the case of secondary education for two reasons. First, secondary education is made up of different types of schools, imposing different fees and offering different forms of aid to students. Second, as a result, the case of secondary education is something of a mix of the cases of primary education and higher education.

Information needed. The required data concern costs on the one hand and receipts on the other. The costs of higher education include:

- Tuition fees
- School expenditures (books, stationery, etc.)
- Living expenditures
- Forgone earnings.

Receipts include:

- Proceeds from student work
- Direct public aid in money (scholarships and other stipends)
- Direct public aid in kind (subsidies to student housing and student cafeterias, free transport, etc.)
- Public aid to the parents of students (tax rebates).

The difference between costs and receipts represent the true cost of education to the student. Because information on public aid to the parents is not available and because one cannot be sure that it is used to finance university studies, they shall be excluded.

On the side of costs, we know that fees are negligible or at least very low everywhere in West Africa. Living expenditures are generally not high and become negative if one substracts from them public aid in kind to the students. [11] For instance, in the Ivory Coast in 1978 students contributed 239 million CFAF to their room and board, and the state contributed 1,921 million. Although one should deduct from that administrative costs, one may say that Ivorian students paid hardly more than 10% of the cost of their room and board if they chose to eat only in the student cafeterias. We do not have data on school expenditures, [12] but forgone earnings may be evaluated because most secondary school graduates work in the urban modern sector, where wage schedules are fairly well known.

On the side of receipts, scholarships are known, but public aid in kind cannot always be isolated in budgetary documents. No precise information is available on receipts from gainful employment, but it is well known that African university students generally do not hold jobs.

Evaluation of net cost per student. In the case of the Ivory Coast, in 1978 per student. [13] Fees were 4,140 CFAF. For net living expenditures, the total cost of the Centre National des Oeuvres

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11/ Ideally, one should compute net living expenditures--that is, the net (positive or negative) difference between what the student spends for student living and what he or she would have spent in "ordinary life." The numerous problems involved in such a calculation will not be mentioned here. The interested reader may refer, for a thorough discussion of the problem, to Millot and Orivel (1979).

12/ A survey is under way in Malawi, but none seems to have been made in West Africa.

13/ Only university students are considered. We are using data given in Enseignement et Formation en Cote d'Ivoire-Statistiques. Annee Scolaire 1978-79 (Republique de Cote d'Ivoire 1978-79). Another report, by J.M. Maigne (1980), uses the same sources but gives slightly different figures.

Universitaires (CNOU), which runs the cafeterias and student dormitories, was 2,171.2 million CFAF (of which the students paid only 239.3 million).

If we assume that the students could cover their eating and lodging needs by using CNOU services and that their other living expenses may be considered as approximately equal to the value of the free transport permit which they receive (but whose precise amount we could not obtain), the total net living expenditures are: 239.3 - 1,931.9 = -1,692.6 million CFAF, or approximately -241.800 CFAF per Ivorian student.

For forgone earnings, the average gain of a secondary school graduate was approximately 1.5 million CFAF per year.

For scholarships, each student gets approximately 475,000 CFAF per year.

The balance sheet per student is therefore the following:

- If we consider only expenditures:
    Receipts = 475,000
    Expenditures = approx. 38,000
    Net surplus = 437,000 CFAF
- If we look at costs:
    Incomes = 475,000 + 241,800 = 716,800
    Outgo = 40,000 + 1,500,000 = 1,540,000
    Net cost = 823,200.

If we consider that:

- o This net cost is probably overestimated because we have not taken into account the rising unemployment rate of secondary school graduates
- o The amount received as direct financial aid is approximately equal to one-third of the average salary of a secondary school graduate and more than two times GNP per capita
- o Students have living expenses which are less than one-tenth of those of active people both because of the high subsidies and because the total cost of food and housing is less in student accommodations than the price of the same services on the market, we may then safely conclude that students are very privileged indeed.

It is impossible to make such calculations for other West African countries, but evidence on the level of scholarships and other aid suggests that the situation is more or less the same in many countries. 14/ If we put these observations in balance with the well-known facts that students come, in their majority, from relatively well-to-do families and that in most of these countries there is already (or there soon will be) a surplus of university graduates, we come to the conclusion that a reform of the funding of higher education is in order.

14/ For instance, at the end of the 1970s the average scholarship for a university student in the Central African Republic amounted to approximately one-half of the salary of a secondary school graduate in the public sector, more than one-half in Niger, three-fifths in Mali, one-third in Senegal. In percentage of GNP per capita the average scholarship amounted to: 160% in Senegal, 700% in Mali and the Central African Republic, 800% in Niger.

This is admitted in most of these countries, and new schemes, mostly based on a selective scholarship policy, are being studied almost everywhere. But the data we produce show more clearly than before:

- o How profitable it is to be a student at a time when there is a surplus of graduates
- o Not only that students do not pay for their tuition but that their cost of living is only about one-tenth of what it is to other people.

If we recall that the percentage of public expenditure on education allotted to higher education is between 15 and 25 in most of these countries, and that scholarship and welfare services always represent an important percentage of total recurrent expenditures, [15] this is clearly a case where a participation of students and/or their families would be both possible, important as a cost recovery device, and socially equitable.

School Production

The debate over the introduction of productive work in the school curriculum is almost as old as the debate about what is a "relevant" school curriculum. Opinions about the virtues of such reforms are as divergent today as they were more than a century ago. But the fact is that in recent years productive work has been introduced, or at least recommended, in basic education in most developing countries. The official rationale behind this reform, although it varies from country to country, seems in a majority of cases to be that such work increases the relevance of the curriculum. But the sale of the products of this activity is also generally mentioned as a way to help finance recurrent costs and quality improvements.

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[15] The figures given in the Unesco Statistical Yearbooks (chapter 4, table 44: "Public current expenditure on education: distribution by level of education and by purpose") usually overestimate this percentage for countries in which an important proportion of the higher education teaching staff is foreign and composed of technical assistants because, usually, the portion of their salaries and other amenities paid by the host country does not appear in the ministry of education budget.

Up to now, the economic record of these innovations in Africa is mixed. Many reports mention the same drawbacks.

- Teachers have not received the proper training and tend to scorn such work activities.
- There are no funds to buy implements, which therefore have to be borrowed, which in turn prevents using more up-to-date methods.
- These work activities are not taken into account when the decision to promote (or hold back) a student is taken.

The end result is low productivity and little to sell. Many studies of actual programs draw similarly pessimistic conclusions. They generally show that these reforms induce a decline in general achievement because time is taken away from teaching. Surveys of the large-scale reforms conducted in Tanzania, Cuba, and China do not support optimism. But strictly from the point of view of cost recovery, two studies of experiments still in their first stage in two West African countries give fairly positive results and therefore must be mentioned.

- In Benin, a study made in 1975-76 on a sample of 60 primary schools (Unesco 1978b, Annex 73) showed that: (1) receipts from sales of products were four times as high as production costs;

(2) net income represented around 50% of current school expenditures (salaries excluded); net income represented approximately US$2.5, which is more than the average school fee where it exists.

- In Mali, a survey of 39 schools comprising 213 classes made in 1978-79 (Unesco 1976, p. 34 and Annex 3.12) showed a net benefit of 3,202,305 Malian francs (MF), or 336 MF per pupil (approximately equal to US$0.80).

Because the reports which give these figures also insist on the many shortcomings of these experiments, these results can be taken as rather encouraging, since they seem to imply that there is some possibility of covering recurrent costs with the proceeds of sales and of perhaps financing more and better teaching aids. But the overall feeling about the effects of introducing productive work in schools is too pessimistic for one to draw this type of conclusion without relying on new and more extensive observations.

Private Schools

Another, although indirect, way for the government to reduce the financial burden of public education is to encourage the development of private schools. In this way it may stabilize the education budget, and perhaps even improve the quality of public schools, by spending as much as before but on a smaller number of students. As we have seen earlier, this may even reduce the social cost of education if further studies confirm that the cost per student is lower in private schools.

But before endorsing such a policy, some remarks are in order.

- This would run counter to the general trend in primary education, where with one exception (that of Upper Volta) the percentage of private schools is decreasing.
- It might be impossible in upper secondary education, where the proportion of private schools is already high in many countries.
- It would be politically impossible unless the ministry of education were assured of being able to exert strict control over curriculum and qualification of teachers.
- Control usually has for its counterpart subsidies, so that the transfer is not as financially advantageous as one might think.
- This is made even more true by the fact that trends can be altered only if financial inducements are given in the form of higher subsidies (which would probably have to apply also to existing private schools).
- Private schools usually raise fairly high fees; the danger is therefore to create a segregation between private schools attended by the children of the rich (because quality is higher) and public schools where the children of the poor would go and whose quality could not be increased unless the education budget were increased.

These remarks show that this type of solution to the budget squeeze is not necessarily feasible; nor is it always advisable for equity reasons. But they also show that it should not be put aside out of hand without giving it serious consideration. 16/

16/ For a balanced appraisal of the pro's and con's, see J. Meerman (1980).

ANNEX

SUPPORTING DATA FOR PART II

Table A.1: EAST AFRICA: EVOLUTION OF NATIONAL EFFORT FOR EDUCATION (% OF GNP SPENT PUBLICLY ON EDUCATION). CURRENT EXPENDITURES, 1970-78.

COUNTRY	1970	1974	1976	1978
BOTSWANA	4.4	3.21	4.24	6.67
BURUNDI	2.3	2.25	2.24	2.64
ETHIOPIA	2.2	2.05	2.06 a/	1.98
KENYA	3.8	5.25	5.50	5.27
LESOTHO	3.3	n.a.	n.a.	n.a.
MADAGASCAR	3.6	2.69	3.85	5.46 b/
MALAWI	3.0	2.14	2.06 a/	2.01
MAURITIUS	3.4	2.44	4.75	5.61
RWANDA	2.3	3.76	2.01	2.04
SOMALIA	1.8	2.56	3.55	1.80 c/
SUDAN	2.7	4.95	n.a.	n.a.
SWAZILAND	4.5	4.79	2.50	n.a.
TANZANIA	3.7	4.04 d/	4.04	4.26
UGANDA	3.2	2.74	2.58	1.51 d/
ZAIRE	5.9	5.48 d/	n.a.	5.10
ZAMBIA	3.6	3.86	5.14	4.60

n.a. Not available.
Source: See Table 3.1 in text.
a/ 1975.
b/ 1977.
c/ Ratio computed from sources different from sources for earlier years.
d/ 1973.

Table A.2: WEST AFRICA: EVOLUTION OF NATIONAL EFFORT FOR EDUCATION (% OF GNP SPENT PUBLICLY ON EDUCATION). CURRENT EXPENDITURES, 1970-78.

COUNTRY	1970	1974	1975	1978
ANGOLA	1.8	n.a.	n.a.	n.a.
BENIN	4.02	4.62	4.82	5.02
CAMEROON	3.5	3.05	3.27	2.55 a/
C.A.R.	3.8	4.76 b/	4.33	n.a.
CHAD	2.6	2.18	2.36	n.a.
CONGO (PEOPLES REP.)	5.8	5.55	8.51	8.31
GABON	3.1	1.61	1.53	3.68
(THE) GAMBIA	3.0	2.39	3.49	4.17
GHANA	3.8	4.21	3.88	n.a.
GUINEA	6.4	5.03 c/	n.a.	5.25
GUINEA BISSAU	5.5	n.a.	n.a.	n.a.
IVORY COAST	5.5	5.33	5.30	5.39
LIBERIA	2.7 d/	2.12	2.12	4.61
MALI	4.0	4.45 c/	4.67 e/	5.27
MAURITANIA	3.8	3.78 e/	3.67	4.08
NIGER	1.9	3.43	3.23 e/	3.02 f/
NIGERIA	2.5	1.92	2.32	2.91
SENEGAL	3.7	2.66	3.41	3.95 f/
SIERRA LEONE	2.8	3.98 b/	3.95	3.40 f/
TOGO	2.0	4.08	4.99	6.0
UPPER VOLTA	2.3	2.17	2.33	2.68

Source: See Table 3.1 in text.

a/ Ratio computed from sources different from sources for earlier years.
b/ 1973.
c/ 1972.
d/ Total public expenditures on education.
e/ 1975.
f/ 1977.

Table A.3: AVERAGE PRIMARY SCHOOL TEACHERS SALARIES. SELECTED WEST AFRICAN COUNTRIES IN ABSOLUTE AND RELATIVE TERMS, 1978 OR AROUND.

COUNTRY	AVERAGE SALARIES	
	U.S.$	% of GNP per capita
BENIN	2,450	10.6
C.A.R.	2,990	12.0
CONGO (PEOPLES REPUBLIC)	3,540	6.6
GHANA	1,720	4.4
GUINEA	1,850	8.9
GUINEA BISSAU	1,040	3.6
IVORY COAST	6,300	7.5
MALI	2,640	22.0
MAURITANIA	4,500	18.0
NIGER	2,830 a/	13.5
SENEGAL	4,200	14.0
TOGO	1,230	3.9
UPPER VOLTA	2,380	14.9

Source: Unesco *Statistical Yearbook* and various Unesco and World Bank reports.

a/ Qualified teachers only.

Table A.4: PUPIL-TEACHER RATIOS AT THE PRIMARY LEVEL IN WEST AFRICA.

COUNTRY	1960	1965	1970	1975	1978
BENIN	41	42	44	48	56
CAMEROON	n.a.	47	48	51	51
C.A.R.	58	56	64	67	65(1977)
CHAD	n.a.	83	65	77	n.a.
CONGO (PEOPLES REP.)	53	60	62	59	53
EQUAT. GUINEA	76	62	n.a.	57(1973)	n.a.
GABON	n.a.	39	46	48	46
(THE) GAMBIA	31	31	27	26	26
GHANA	n.a.	29	30	30	27
GUINEA	66	41	44	40	38
GUINEA BISSAU	39	30	45	34	33(1979)
IVORY COAST	41	47	45	44	41
LIBERIA	32	32	36	41	43
MALI	45	41	40	41	43
MAURITANIA	20	20	24	35	44
NIGER	n.a.	42	39	39	41
NIGERIA	30	33	34	n.a.	n.a.
SENEGAL	n.a.	43	45	49	43
SIERRA LEONE	36	32	32	32	32(1977)
TOGO	63	50	58	60	55
UPPER VOLTA	47	49	44	47	52

Table A.5: PRIMARY EDUCATION. INDICES OF QUALITY. SELECTED WEST AFRICA COUNTRIES.

COUNTRY	Percentage		
	Of unqualified teachers a/	Of classroom constructed with non-durable material	Of pupils having textbooks b/
BENIN	55	40	Very low
C.A.R.	48	High	Very low
CHAD	70	65	Very low
CONGO (PEOPLES REPUB.)	14	n.a.	Low
IVORY COAST	2.5	n.a.	Very high
MALI	n.a.	52	Low
MAURITANIA	45	n.a.	n.a.
NIGER	42	12 c/	n.a.
SENEGAL	5	16 d/	n.a.
SIERRA LEONE	61	High	Low
TOGO	42	41	n.a.
UPPER VOLTA	2	High	Very low

Source: Unesco and World Bank data.

a/ For Francophone countries, the percentage covers all the teachers who are not "instituteurs" or "instituteurs-adjoints".

b/ It is impossible to have precise data at the national level. In any case, the overall average is not sufficient because the situation varies widely from region to region and from cities to villages, the latter being usually much more poorly equipped.

c/ Percentage of thatch-roofed classes.

d/ Percentage of classes classified as being in "bad shape."

Table A.6: EVOLUTION OF EXPENDITURES PER STUDENT IN HIGHER EDUCATION. SELECTED SUB-SAHARAN AFRICAN COUNTRIES IN SELECTED YEARS (1976 U.S. DOLLARS).

CAMEROON	CONGO	IVORY COAST	KENYA	LIBERIA
1964: 3,094	1965: 842	1965: 5,390	1965: 3,149	1965: 4,156
1965: 4,013	1970: 1,204	1970: 3,031	1970: 1,260	1967: 2,533
1968: 3,320	1971: 2,391	1973: 4,460	1971: 1,266	1975: 1,295
1970: 3,009	1972: 2,377	1975: 6,422	1972: 1690	1978: 3,100
1971: 2,721	1975: 4,755	1976: 5,067	1975: 2,441	
	1976: 3,634	1977: 5,325	1976: 2,347	
	1978: 3,547	1978: 6,489		

GHANA	MADAGASCAR	MALAWI	TANZANIA	ZAMBIA
1965: 5,833	1965: 249	1965:10,036	1965: 5,514	1970: 8,316
1968: 6,128	1970: 192	1970: 3,658	1966: 4,675	1975: 2,558
1970: 5,605	1971: 1,599	1971: 3,604	1970: 4,150	1977: 2,396
1971: 4,965	1972: 1,728	1972: 3,639	1971: 4,320	1978: 2,565
1973: 3,583	1975: 997	1975: 3,027	1972: 3,094	
1974: 4,982	1976: 951		1975: 5,139	
1975: 4,248	1977: 1,317		1976: 3,533	
			1977: 5,510	

Source: Unesco *Statistical Yearbook* (various years).

Table A.7: EVOLUTION OF THE COST OF PRIMARY EDUCATION PER PUPIL. SELECTED SUB-SAHARAN COUNTRIES, 1970-78 (1978 U.S. DOLLARS)

COUNTRY	1970	1978	Trend
BENIN	51	50	=
C.A.R.	n.a.	48	n.a.
CONGO (PEOPLES REP.)	52	68	+
GAMBIA	29	71 a/	+
GHANA	23	67	+
IVORY COAST	74	186	+
NIGERIA	36	57	+
NIGER	79	77 b/	=
TOGO	24	25	=
MALI	47 c/	64	+
SIERRA LEONE	20 c/	31	+
UPPER VOLTA	33 d/	45	+
BOTSWANA	42	103	+
BURUNDI	30 c/	45	+
ETHIOPIA	34	22	-
KENYA	34	36	=
MADAGASCAR	27	30	+
MALAWI	19	12 a/	-
MAURITIUS	49	170	+
RWANDA	13	23	+
SOMALIA	107	44	-
SWAZILAND	31 d/	39	+
UGANDA	39	30 e/	-
TANZANIA	36	29	-
ZAMBIA	66	60	-

+ Positive; - negative; = change less than 5%.

Source: Unesco *Statistical Yearbook* (various years) except Niger (1977) and Sierra Leone (1978); where World Bank data were used.

a/ 1979.
b/ 1977.
c/ 1969.
d/ 1968.
e/ 1975.

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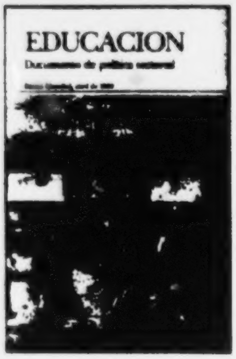

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